U.S. Army Center for Health Promotion and Preventive Medicine

U

S

TRAINING MUNITIONS HEALTH RISK
ASSESSMENT
NO. 39-EJ-1485-00
RESIDENTIAL EXPOSURE FROM INHALATION OF
AIR EMISSIONS FROM THE
M882 9-MM BALL CARTRIDGE
DEPARTMENT OF DEFENSE IDENTIFICATION CODE: A363



C

Prepared by:

Environmental Health Risk Assessment Program

H

Prepared for:

U.S. Army Environmental Center

P

Published date:

15 June 2001

P

Approved for public release; distribution unlimited

20011218 134

M

Readiness Thru Health

U.S. Army Center for Health Promotion and Preventive Medicine

The lineage of the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) can be traced back over 50 years. This organization began as the U.S. Army Industrial Hygiene Laboratory, established during the industrial buildup for World War II, under the direct supervision of the Army Surgeon General. Its original location was at the Johns Hopkins School of Hygiene and Public Health. Its mission was to conduct occupational health surveys and investigations within the Department of Defense's (DOD's) industrial production base. It was staffed with three personnel and had a limited annual operating budget of three thousand dollars.

Most recently, it became internationally known as the U.S. Army Environmental Hygiene Agency (AEHA). Its mission expanded to support worldwide preventive medicine programs of the Army, DOD, and other Federal agencies as directed by the Army Medical Command or the Office of The Surgeon General, through consultations, support services, investigations, on-site visits, and training.

On 1 August 1994, AEHA was redesignated the U.S. Army Center for Health Promotion and Preventive Medicine with a provisional status and a commanding general officer. On 1 October 1995, the nonprovisional status was approved with a mission of providing preventive medicine and health promotion leadership, direction, and services for America's Army.

The organization's quest has always been one of excellence and the provision of quality service. Today, its goal is to be an established world-class center of excellence for achieving and maintaining a fit, healthy, and ready force. To achieve that end, the CHPPM holds firmly to its values which are steeped in rich military heritage:

- ★ Integrity is the foundation
 - ★ Excellence is the standard
 - * Customer satisfaction is the focus
 - ★ Its people are the most valued resource
 - ★ Continuous quality improvement is the pathway

This organization stands on the threshold of even greater challenges and responsibilities. It has been reorganized and reengineered to support the Army of the future. The CHPPM now has three direct support activities located in Fort Meade, Maryland; Fort McPherson, Georgia; and Fitzsimons Army Medical Center, Aurora, Colorado; to provide responsive regional health promotion and preventive medicine support across the U.S. There are also two CHPPM overseas commands in Landstuhl, Germany and Camp Zama, Japan who contribute to the success of CHPPM's increasing global mission. As CHPPM moves into the 21st Century, new programs relating to fitness, health promotion, wellness, and disease surveillance are being added. As always, CHPPM stands firm in its commitment to Army readiness. It is an organization proud of its fine history, yet equally excited about its challenging future.

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gethering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information including superstance and requiring the hurden to Defense Washington Headquarters Services Discretariate for Information Constitutes and Plants of Defense Washington Headquarters Services Discretariate for Information Constitutes and Plants of Defense Washington Headquarters Services Discretariate for Information Constitutes and Plants of Defense Washington Headquarters Services Discretariate for Information Constitutes and Plants of Defense Washington Headquarters Services Discretariate for Information Constitutes and Plants of Defense Washington Headquarters Services Discretariate for Information Constitutes and Plants of Plan

of information, inc. (0704-0188), 1215 subject to any penal	Juding suggestions 1 Jefferson Davis High Ity for failing to comp	or reducing the burnway, Suite 1204, Airly with a collection of	den, to Department of Defensions to Defensions of Defensions of the Defension of Defe	se, Washington He spondents should b ay a currently valid	e aware that OMB control	Services, Directorate for Information Operations and Reports notwithstanding any other provision of law, no person shall be number.
	TE (DD-MM-YY		ORT TYPE			3. DATES COVERED (From - To)
	•	7 //	Technical R	eport		March 1999-August 2001
4. TITLE AND Training Mun Residential Ex	SUBTITLE itions Health F	Risk Assessmen	nt No.39-EJ-1485-00 e Air Emissions from t		5a. COI	NTRACT NUMBER
9mm Ball Car	ttridge, Depar	rtment of Defe	snse Identification Cod	le: A363	5b. GR/	ANT NUMBER
					5c. PRO	OGRAM ELEMENT NUMBER
6. AUTHOR(S) Joleen Mobley	, Stafford D.F	R.Coakley			5d. PRC	DJECT NUMBER
					5e. TAS	SK NUMBER
					5f. WO	RK UNIT NUMBER
	enter for Healt		ND ADDRESS(ES) and Preventive Medicine	e		8. PERFORMING ORGANIZATION REPORT NUMBER
	ving Ground, l	Maryland 2101	0-5422			Risk Assessment # 39-EJ-1485-00
	nvironmental C		IE(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S) USAEC
	ving Ground, I	MD 21010-540	1			11. SPONSOR/MONITOR'S REPORT NUMBER(S) SFIM-AEC-PC-CR-200148
Distribution U		ITY STATEMEN	T			
	NTARY NOTES act: Tamera R	ush 410-436-68	349			
9mm Ball Car breathing air of health risks to emissions from was then used item was active hypothetical re- potential for health the modeled so 9mm Ball Car 15. SUBJECT 1	nt evaluated the trridge. This emissions follow the hypothetic in the 9mm Carlin an air disperated. Modeled esident breather ealth risks from the tridge.	document pres wing the use of al resident from tridge were control to drain concentral s. This intake in inhighlation of intrations. Student	ent the evaluation of the finilitary firing range in inhalation of air emillected in a test chamb determine ambient air tions were combined was combined with the fithese substances. The ly results showed no p	he potential for es during train assions from the er (at Aberdor concentration with exposure e substance's he health risk cotential for he	or adverse ning exer- ne 9mm (een Test ns at a lo- informat health in included	athing air emissions following use of the e human health effects to teh offsite residents cises. Study results showed no protential for Cartridge. To conduct this study, air Center, Aberdeen, MD). This information cation downwind from the site where the ion to estimate the amount of substances the formation, to determine if there is a both long-term and short term exposures to a from inhalation of air emissions from the
emissions, abo	erdeen test cen	ter, characteriz	ation, health risk, mur	nitions, firing	point	
	CLASSIFICATIO		17. LIMITATION OF ABSTRACT	OF	19a. NAN Tamera	ME OF RESPONSIBLE PERSON Rush
U	U	U	UU	PAGES	19b. TEL	EPHONE NUMBER (Include area code) 410-436-6849



DEPARTMENT OF THE ARMY U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE 5158 BLACKHAWK ROAD ABERDEEN PROVING GROUND, MARYLAND 21010-5403

MCHB-TS-EHR

TRAINING MUNITIONS HEALTH RISK ASSESSMENT NO. 39-EJ-1485-00 RESIDENTIAL EXPOSURE FROM INHALATION OF AIR EMISSIONS FROM THE M882 9-MM BALL CARTRIDGE

EXECUTIVE SUMMARY

This assessment evaluated the potential for human health effects to offsite residents breathing air emissions following use of the M882 9-mm Ball Cartridge (M882) on firing ranges during training exercises.

To conduct this assessment, air emissions from the M882 were collected in a test chamber at the U.S. Army Aberdeen Test Center, Maryland. The data collected from the Firing Point Emission Study provided the amount and types of substances released from the M882. This information was then used in an air dispersion model to determine ambient air concentrations at a location 100 meters (328 feet) downwind from the M882 firing location. Since the training facility in this assessment is hypothetical, the air model used assumptions that provided conservative estimates of air concentrations.

Modeled air concentrations were combined with exposure information (e.g., number of cartridges used per year) to estimate the amount of each substance the hypothetical offsite resident breathes. This estimate was then compared with the substance's health information, which was obtained from agencies such as the U.S. Environmental Protection Agency, to determine if there is a potential for health risks from inhalation of these substances.

The health risk assessment included both long-term (30 years) and short-term (15-minute or 1-hour) exposures to modeled substance concentrations. Assessment results, generated using conservative methods, showed that the hypothetical offsite resident breathing air as close as 100 meters (328 feet) from the M882 firing location is safe from these emissions. It should be noted that at most training installations, training areas are over 1,000 meters (over half a mile) away from populated areas.

TABLE OF CONTENTS

1.	PURPOSE	
2.	AUTHORITY	
3.	REFERENCES	
4.	BACKGROUND	1
	4.1 CARTRIDGES AND THEIR USE	1
	4.2 WHAT IS THE M882?	1
	4.3 USE OF THE M882	2
	4.4 ASSESSMENT SUMMARY	2
5.	DATA COLLECTION AND AIR MODELING	3
	5.1 EMISSION FACTORS	3
	5.2 BACKGROUND AND DESCRIPTION	3
	5.3 MODEL ASSUMPTIONS	3
	5.4 GENERAL METHODOLOGY	5
	5.5 USE OF MODEL OUTPUT	5
	5.6 DETERMINATION OF SUBSTANCE-SPECIFIC EMISSION RATES	6
6.	RISK ASSESSMENT	7
	6.1 EXPOSURE ASSUMPTIONS	7
	6.2 TIME-AVERAGING	7
	6.3 TOXICITY ASSESSMENT	
7.	RISK CHARACTERIZATION	.14
	7.1 CHRONIC HEALTH RISK	
	7.2 ACUTE HEALTH RISK	14
	7.3 FACT SHEET	15
8. I	UNCERTAINTY DISCUSSION	15
9. (CONCLUSION	17
10.	RECOMMENDATIONS	17
11.	POINT OF CONTACT	18

LIST OF APPENDICES

REFERENCES	APPENDIX A
AIR DISPERSION MODELING OUTPUT DATA	APPENDIX B
HEALTH-BASED SCREENING LEVELS	
AND ACUTE TOXICITY VALUES	APPENDIX C
RISK ASSESSMENT DATA	APPENDIX D
FACT SHEET SUBMITTED TO THE U.S. ARMY ENVIRONMENTAL	
CENTER	APPENDIX E
LIST OF TABLES	
TABLE 1 – SOURCE PARAMETERS	4
TABLE 2 – WORST-CASE METEOROLOGICAL PARAMETERS	5
TABLE 3 – AIR MODEL INPUT PARAMETERS	5
TABLE 4 - FREQUENCY OF USE FOR THE M882	7
TABLE 5 – EXPOSURE PARAMETERS USED TO DETERMINE	
TIME-AVERAGED CHRONIC AIR CONCENTRATIONS	8
TABLE 6 – SUMMARY OF RfCs USED FOR PETROLEUM	
HYDROCARBONS	12
TABLE 7- TYPES OF UNCERTAINTY	16

LIST OF ACRONYMS

AEC U.S. Army Environmental Center

AEGL Acute Exposure Guideline Levels

AIHA American Industrial Hygiene Association

Al Aluminum

ATC U.S. Army Aberdeen Test Center

ATSDR Agency for Toxic Substances and Disease Registry

ATV Acute Toxicity Value

CO₂ Carbon Dioxide

DODIC Department of Defense Identification Code

DOE U.S. Department of Energy

EPA U.S. Environmental Protection Agency

ERPG Emergency Response Planning Guidelines

HBSL Health-Based Screening Level

INPUFF Integrated PUFF Model

NAAQS National Ambient Air Quality Standards

NEW Net Explosive Weight

OEL Occupational Exposure Limit

PM₁₀ Particulate Matter under 10 microns in size

PRG Preliminary Remediation Goals

RBC Risk-Based Concentration

RfC Reference Concentration

TEEL Temporary Emergency Exposure Limits

TPH Total Petroleum Hydrocarbons

TSP Total Suspended Particulates

USACHPPM U.S. Army Center for Health Promotion and Preventive Medicine

TRAINING MUNITIONS HEALTH RISK ASSESSMENT NO. 39-EJ-1485-00 RESIDENTIAL EXPOSURE FROM INHALATION OF AIR EMISSIONS FROM THE M882 9-MM BALL CARTRIDGE

1. PURPOSE

This document presents the assessment of the potential for human health effects to offsite residents breathing air emissions following use of the M882 9-mm Ball Cartridge (M882) on firing ranges during training exercises.

2. AUTHORITY

Memorandum, U.S. Army Environmental Center, 4 June 1999, Subject: Pyrotechnics Risk Assessment.

3. REFERENCES

See Appendix A for a list of references.

4. BACKGROUND

4.1 CARTRIDGES AND THEIR USE

Cartridges are cases that contain a primer, propelling charge, and projectile. The primer is needed to activate the propelling charge, which provides the force to send the projectile to a target. Examples of projectiles include bullets, rockets, and missiles. Cartridges are also referred to as "rounds" and are fired from weapons such as pistols or rifles.

4.2 WHAT IS THE M882?

The M882 is a type of ball ammunition used in training and combat. The M882 does not have any notable markings and can be identified by its plain bullet tip (Reference 1). Each M882 cartridge is about as long as the width of a quarter.

The M882 consists of a cartridge case and bullet. The cartridge case is made of copper alloy and the bullet consists of a copper alloy jacket and a lead-antimony slug. The propelling charge is made primarily of nitrocellulose and nitroglycerin. Nitrocellulose is commonly used in furniture lacquers, printing inks, nail polish, and as a primary ingredient in smokeless propellants for military and commercial use. Nitroglycerin is a component in dynamite and is used for military and industrial purposes such as mining and demolition.

4.3 USE OF THE M882

The M882 is used with pistols and submachine guns (Reference 2). During military training activities, the M882 is used on firing ranges. Soldiers use the M882 in training to learn to safely use weapons in preparation for combat.

4.4 ASSESSMENT SUMMARY

The general assessment approach consisted of two main parts: air dispersion modeling and exposure assessment, which are briefly discussed in the paragraphs below. Sections 5 through 7 present a discussion of the methodology used for this assessment.

Emissions data used in the air dispersion modeling was obtained from the Firing Point Emission Study, conducted by the U.S. Army Aberdeen Test Center (ATC), at Aberdeen Proving Ground, Maryland (Reference 3). This study was funded by the U.S. Army Environmental Center (AEC) with the purpose of identifying and quantifying emissions from weapons firing. Data from this study was generated by firing munitions with weapons that are representative of those used by the U.S. Army during training operations. Emissions data for the M882 was generated by firing it from the M9 pistol.

The emissions data for the M882 was used with an atmospheric dispersion model to estimate the average concentrations that may be experienced by an offsite resident. Since this assessment is designed to provide results that would be applicable to most Army training facilities, the training area used in this assessment was a hypothetical one. While most training areas are at least 1,000 meters away from populated areas, as a conservative distance, it was initially assumed that a person could reside 100 meters downwind from the firing point (location where the pistol is positioned). In addition, air-modeling parameters were selected to mimic worst-case conditions.

The exposure assessment included calculations of time-averaged concentrations for both long-term (chronic) and short-term (acute) exposures. For the purpose of this assessment, air concentrations were averaged over 30 years for chronic exposures and 1-hour or 15 minutes for acute exposures. Using a screening approach, a substance's estimated time-averaged air concentration was then compared to chronic health-based screening levels (HBSLs) established by the U.S. Environmental Protection Agency (EPA) or acute toxicity values (ATVs) established by selected agencies depending on the exposure duration (i.e., 30 years versus 1-hour or 15 minutes). The comparison was made using the ratio of the HBSL or ATV to the estimated air concentration for each of the substances evaluated. If this ratio was less than one, no further evaluation was required. This approach is conservative because the exposure assumptions used by the agencies, to establish HBSLs and ATVs, are likely to overestimate the exposures experienced by offsite residents living near firing ranges. If the chronic or acute averaged concentrations (C_{chronic} and C_{acute}) were greater than the screening levels,

producing a ratio greater than one, further evaluation would be warranted to determine the potential for health effects. Note that concentrations greater than the screening levels do not indicate an onset of health effects, but rather, the potential for such.

5. DATA COLLECTION AND AIR MODELING

5.1 EMISSION FACTORS

Emission factors, used to derive the air modeling emission rates used in this assessment, were generated from the Firing Point Emission Study conducted by the ATC (Reference 3). This study identified and quantified air emissions from the firing of the M882 from the M9 pistol. The data provided by the ATC included the net explosive weight (NEW), the substances sampled, and substance-specific emission factors. Emissions data from the Firing Point Emission Study are included in the first four columns of the table located in Appendix B.

5.2 BACKGROUND AND DESCRIPTION

Air dispersion models are available to mathematically simulate plume behavior and to estimate downwind concentrations of substances emitted from various sources. However, specific models are not available to determine the dispersion of emissions from munitions used during training. Estimating the magnitude and location of these concentrations depends on many factors including the amount and type of emissions, the behavior of the source, and meteorological conditions. Since a specific model is not available for modeling the use of munitions during training, the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) evaluated numerous air models to determine which would be suitable for use with munitions used during training. The USACHPPM recommended using the Integrated PUFF (INPUFF) model to estimate the dispersion of emissions from various munitions sources (Reference 4).

The INPUFF Model (Reference 5) was developed to simulate dispersion from instantaneous or semi-continuous point sources. This Gaussian-integrated puff model is capable of addressing a cloud type release over short periods of time, and computations can be performed for a single point source for multiple receptors. The algorithms used to calculate concentrations assume a vertically uniform wind direction (with no chemical reaction) to compute the contribution of each cloud at a receptor for each time step/interval.

5.3 MODEL ASSUMPTIONS

Some assumptions were made to best represent the firing of the M882 cartridges. These assumptions were as follows:

Typically, with conventional point sources (such as incinerators), the cloud rise and formation are determined by characterizing flue gas exit velocity, temperature, and stack diameter. However, the M882 cartridges are used in conjunction with pistols and submachine guns. For unconventional sources with no real physical stack dimensions, such as pistols, the stack height and diameter were assumed to be equal to the height of the barrel and the bore diameter. No exit velocity was used with this source because the emissions rates generated from the test data were obtained from sampling a stabilized cloud with no exit velocity. Table 1 includes the source parameters used to model the M882 cartridges.

TABLE 1: SOURCE PARAMETERS

Parameter	Model Input
Source/Stack Diameter	0.009 meters
Source/Stack Height	1 meter
Source Exit Temperature	298.15 degrees Kelvin (°K) (or 77 °F)
Exit Velocity	0 meters/second
Initial horizontal dispersion coefficient (σ_y)	0.87 meters
Initial vertical dispersion coefficient (σ_z)	1.07 meters

- Initial cloud dimensions are preferred to model the air emissions from these types of releases. Typically, these dimensions are used to define the initial horizontal and vertical dispersion values (σ_y and σ_z) of the released cloud. This information was not measured during the studies at the ATC; therefore, the cloud dimensions were based on the test chamber dimensions and the volume of air sampled. By assuming an elliptical cloud with the prevailing wind direction being perpendicular to the pistol when fired, the test chamber's radius would be equal to the initial vertical dispersion (σ_z), and the initial horizontal dispersion (σ_y), would be equal to one half the length of the test chamber. The cloud exit temperature was assumed to be equal to the test chamber temperature.
- For the purposes of this assessment, a hypothetical offsite resident was assumed to be located 100 meters directly downwind from the source. The meander of the cloud is a major factor when estimating concentrations at given locations downwind from the source. Assuming that the resident is directly downwind from the source is the same as assuming that there is no cloud meander and the center of the cloud migrates directly over the hypothetical offsite resident. This assumption provides the most conservative modeled concentrations.
- Since this assessment does not look at a specific training site, generic, worst-case meteorological data were used. To determine the worst-case meteorological conditions that would result in the highest air emission concentrations, the modeling was performed using the EPA Risk Management Program Guidance (Reference 6). This guidance includes tables for estimating the footprint of chemical releases and is intended to

inform emergency responders of potential accidental releases. The EPA has defined most default conditions for meteorological modeling parameters. Table 2 lists the meteorological parameters that were used in the air model.

TABLE 2: WORST-CASE METEOROLOGICAL PARAMETERS

Parameter ·	Input Value
Wind Speed	1 meter/second
Atmospheric Stability	Category F
Wind Direction	270°
Ambient Temperature	293 degrees Kelvin (°K) (or 68 °F)

5.4 GENERAL METHODOLOGY

The model was run for a total calculation time of 200 seconds to ensure that the total mass of the cloud had passed the hypothetical resident location. Concentrations were calculated every 2 seconds. The model results indicated that the initial cloud reached the hypothetical offsite resident within 80 seconds and dissipated below the lowest concentration the model calculated, which in this instance $(1 \times 10^{-11} \, \text{g/m}^3)$ occurred within 138 seconds. Table 3 contains the air model input parameters used in this assessment.

TABLE 3: AIR MODEL INPUT PARAMETERS

Parameter	Input Value
Number of meteorological periods (NTIME)	1
Duration of each meteorological period (ITIME)	200 seconds
Number of updates to the source (NSRCDS)	100
Duration/time step between each source update (ISUPDT)	2 seconds
Total time modeled/Simulation Period (NTIME) (ITIME)= (NSRCDS) (ISUPDT)	200 seconds

5.5 USE OF MODEL OUTPUT

The concentrations provided by the INPUFF model were based on a unit emission rate (ER_{unit}) of 1 gram/second from an emission source, and did not represent any substance-specific concentrations from the use of any weapons system. This unit emission rate is typically used for ease of modeling purposes. The relationship between the emission rate and predicted concentration is linear. Therefore, the ratio of the predicted concentration to the unit emission rate was multiplied by each substance-specific emission rate to provide substance-specific concentrations.

5.6 DETERMINATION OF SUBSTANCE-SPECIFIC EMISSION RATES

The actual substance emission rate for one item (ER_1) for each substance was calculated using Equation 1. Example 1 contains a sample calculation using this equation.

$$ER_1 = \frac{EF \cdot CV}{t}$$
 Equation 1

Where:

 ER_1 = emission rate for one item (g/item)/sec

EF = average adjusted emission factor (lb/item)

CV = conversion factor (453.59 g/lb)

t = release duration as obtained from the INPUFF model (sec)

Example 1 Sample Calculation Using Equation 1:

$$ER_1 = \frac{(2.000 E - 04) (453.59)}{(2)}$$

= 4.545 E-02 g/sec

Calculation provided for Carbon Dioxide (CO_2). Appendix B provides the average adjusted emission factor of CO_2 in Ib/item.

Substance-specific ambient concentrations for one item (CONC) were calculated using Equation 2. A sample calculation using this equation is provided in Example 2. Appendix B contains the estimated air concentrations.

$$CONC = ER_1 \cdot \frac{UC}{ER_{unit}}$$
 Equation 2

Where:

CONC = substance concentration based on one item (g/m³)

 ER_1 = emission rate for one item (g/sec)

 ER_{unit} = unit emission rate as used in the model (g/sec)

UC = concentration based on the unit emission rate (g/m³)

Example 2 Sample Calculation Using Equation 2:

$$CONC = (4.545E - 02) \frac{(2.061E - 04)}{(1)}$$

 $= 9.367E-06 \text{ g/m}^3$

Calculation provided for CO₂.

6. RISK ASSESSMENT

6.1 EXPOSURE ASSUMPTIONS

Exposure assumptions were selected using a typical use scenario for the M882 during training exercises. The typical use scenario was provided by the AEC and is based on consultation with their senior training advisor (References 7, 8). The frequency of use for the M882 was required to determine how much substance an offsite resident would be exposed to in the time period of interest (i.e., acute or chronic exposure). Table 4 summarizes the general use scenario for the M882.

TABLE 4: FREQUENCY OF USE FOR THE M882

Parameter	Value Used
Number of cartridges used per year	76,410
Maximum number of cartridges used in 1- hour	800

6.2 TIME-AVERAGING

For the chronic assessment, time-averaged concentrations were calculated by assuming that the hypothetical offsite resident would be exposed for 30 years. This is consistent with the exposure duration used by the EPA, which assumes that the resident spends 30 years at the same residence. By using the same exposure duration, the estimated time-averaged concentrations were compared with the selected HBSLs, which were derived using standard EPA default assumptions.

Using the default residence time established by the EPA, the assumption was made that someone could be exposed to air emissions from 76,410 cartridges per year for 30 years. Table 5 lists the exposure parameters used to estimate concentrations for the chronic assessment. These parameters are based on the typical use scenario provided by the AEC (Table 4) and the assumptions used in the air model run.

TABLE 5: EXPOSURE PARAMETERS USED TO DETERMINE TIME-AVERAGED CHRONIC AIR CONCENTRATIONS

Exposure Parameter	Value Used
Exposure Time (ET _{ctg})	3.333 min/cartridge ¹
Exposure Frequency (EF _{ctg})	76,140 cartridges/year
Exposure Duration (ED)	30 years ²
¹ Based on the total model time of 200 seconds (3.33 min ² EPA default value.	utes) used in the air model run.

Chronic averaged concentrations were calculated using Equation 3. Example 3 shows how this calculation was performed using the total suspended particulates (TSP) concentration as an example. Since TSP is classified as a noncarcinogen, the averaging time (AT) is the same as the exposure duration.

$$C_{chronic} = \frac{CONC \cdot 10^6 \cdot ET_{ctg} \cdot EF_{ctg} \cdot ED}{525,600 \cdot AT}$$
 Equation 3

Where:

 $C_{chronic}$ = average chronic concentration (μ g/m³)

CONC = average modeled concentration for one cartridge (g/m³)

 10^6 = unit conversion (µg/g)

 ET_{ctg} = exposure time per cartridge (minutes/cartridge)

 EF_{ctg} = exposure frequency (cartridges/year)

ED = exposure duration (years)

525,600 = unit conversion (minutes/year)

AT = averaging time (years)

(carcinogenic endpoint: AT = 70 years noncarcinogenic endpoint: AT = ED)

Example 3 Sample Calculation Using Equation 3:

 $= 4.78E-01 \mu g/m^3$

$$C_{chronic(TSP)} = \frac{(9.868E - 07)(10^6)(3.333)(76,140)(30)}{(525,600)(30)}$$

Appendix B provides the average modeled concentration for one cartridge (CONC). Table 5 includes the exposure parameters.

Unlike the chronic assessment, only limited guidance for evaluating acute exposures is currently available. Since many cartridges may be fired in a short period of time, however, acute exposures cannot be overlooked. For the purpose of this assessment, acute exposure is defined as a 1-hour or 15-minute exposure. The 1-hour or 15-minute acute exposure averaging times allow for comparison with guidelines developed specifically for emergency planning purposes (see discussion on acute toxicity below).

The exposure frequency is based on the number of cartridges used per 1-hour or 15 minutes depending on the guideline used for comparison. This information is based on the use scenario provided in Table 4. To estimate air concentrations for potential acute health effects, it was conservatively assumed that 800 M882s are fired in 1- hour. The average acute concentrations were computed using Equation 4. Example 4 contains a sample calculation using this equation. Since TSP does not have an ATV, aluminum (AI) is used as the example substance.

$$C_{acute} = \frac{CONC \cdot 10^6 \cdot ET_{c/g} \cdot EF_{c/g}}{60}$$
 Equation 4

Where:

 C_{acute} = average acute concentration (µg/m³)

CONC = average modeled concentration for one cartridge (g/m³)

= unit conversion (μ g/g)

ET_{ctg} = exposure time per cartridge (minutes/cartridge)

EF_{ctg} = exposure frequency (cartridges/hour)*

= unit conversion (minutes/hour)

^{*} Based on 1-hour or 15 minute (0.25 hour) ATV

Example 4 Sample Calculation Using Equation 4:

$$C_{acute(Al)} = \frac{(3.305E - 09)(10^6)(3.333)(800/0.25)}{60}$$

 $= 5.87E-01 \mu g/m^3$

Appendix B provides the average modeled concentration for one cartridge (CONC) for Al.

6.3 TOXICITY ASSESSMENT

The potential for health effects was determined by comparing time-averaged air concentrations to HBSLs and ATVs, which are developed from a substance's known toxicity. These toxicity values typically include different levels of safety factors depending on the level of confidence of the critical study. Appendix C contains a table of screening toxicity values used for the chronic and acute assessments.

6.3.1 CHRONIC ASSESSMENT

The chronic assessment was conducted using a screening approach. Using this method, a substance's estimated time-averaged air concentration was compared to its HBSL by using the ratio of the HBSL to the estimated concentration. If this ratio was less than one, no further evaluation was necessary. This approach is conservative because the exposure assumptions used by the EPA, to establish HBSLs, assume that the resident is continuously exposed for 350 days per year (assuming 2 weeks vacation per year). In contrast, exposure to air emissions from actual training activities at a firing range is intermittent and is not likely to occur on a daily basis year round.

A hierarchy of sources was developed for selection of the HBSLs to quantitatively evaluate as many of the identified substances as possible. The hierarchy of sources used was as follows:

- Clean Air Act, EPA National Ambient Air Quality Standards (NAAQS) (Reference 11)
- > EPA Region 9 Preliminary Remediation Goals (PRGs) (Reference 10)
- > EPA Region 3 Risk-Based Concentrations (RBCs) (Reference 9)

Some substances have neither PRGs nor RBCs because they have their own set of regulatory standards. Under the Clean Air Act, the EPA is required to establish NAAQS for several substances considered harmful to public health and the environment. Currently, NAAQS are available for seven substances. The NAAQS for the longer averaging time were used for the chronic assessment. Depending on the

substance, this can range from an 8-hour average to an annual average. In addition, since the majority of the measured TSP was PM_{10} (particulate matter under 10 microns in size) (Reference 3), the NAAQS for PM_{10} was used to evaluate the potential for health effects from exposure to TSP.

Next on the hierarchy, after the NAAQS, are the EPA Region 9 PRGs and the EPA Region 3 RBCs. Since the methodology used by EPA Region 9 to develop the PRGs generally results in lower values than the EPA Region 3 RBCs, the PRGs were first on the hierarchy of sources. The RBCs were used when a PRG was not available. To ensure that the most recent information was used, the Internet sites of both EPA Regions were checked. The HBSLs used for this assessment are presented in Appendix C.

Although the general approach used by both EPA Region 3 and Region 9 is the same, the exposure assumptions differ enough so that final recommended values can vary to a certain degree. In both methods, a substance's screening concentration was selected using the toxicity endpoint that derives a lower concentration. For example, if a substance has a known systemic toxicity and is a carcinogen, the screening concentration was calculated using both toxicity values. To maintain a conservative approach, EPA then selected the lower screening concentration as the recommended PRG or RBC.

Example 5 shows a sample calculation of how a substance's estimated chronic concentration was compared to its HBSL using the TSP concentration as an example.

Example 5

Sample Calculation Comparing a Substance's Estimated Chronic Concentration to Its HBSL:

$$\frac{C_{chronic(TSP)}}{HBSL} = \frac{4.78E - 01}{5.00E + 01}$$
$$= 9.56E - 03 < 1$$

In this case, the resulting ratio is less than one, indicating that further evaluation is not necessary.

Many petroleum hydrocarbons were detected but do not have specific screening levels. Therefore, the approach recommended by the Total Petroleum Hydrocarbon Criteria Working Group (Reference 12) was adopted to evaluate petroleum hydrocarbon mixtures. Based on the working group's assessment of various hydrocarbons, it was recommended that mixtures be separated according to a

substance's number of carbons and its chemical class (i.e., aliphatic or aromatic¹). Generally, as a substance's carbon number increases, its molecular weight increases, and it is, therefore, not a substance of concern via inhalation. The working group also concluded that aromatic hydrocarbons tend to be more toxic than aliphatic hydrocarbons (Reference 12). Table 6 presents the inhalation toxicity values used to evaluate exposure to petroleum mixtures. To be consistent with the methodology used in this assessment, the reference concentrations (RfCs) were converted to PRGs using EPA Region 9 exposure assumptions. The resulting PRGs were used as the HBSLs for the petroleum hydrocarbons in this assessment. These values are presented in Appendix D.

TABLE 6: SUMMARY OF RfCs USED FOR PETROLEUM HYDROCARBONS1

Carbon Range	Aromatic Inhalation RfC (mg/m³)	Aliphatic Inhalation RfC (mg/m³)
C ₅ – C ₆ C _{>6} – C ₈		18.4
C _{>7} – C ₈	0.4	
$C_{>8} - C_{10}$ $C_{>10} - C_{12}$ $C_{>12} - C_{16}$	0.2	1.0
C _{>16} - C ₂₁ C _{>21} - C ₃₅	NA	NA

'Reference 12

NA = not applicable for high molecular weight TPHs (Total Petroleum Hydrocarbons) (C_{>16}) because substances in this carbon range are not volatile and therefore, inhalation is not a pathway of concern.

6.3.2 ACUTE ASSESSMENT

An established method for assessing acute health effects is not currently available. In 1995 the EPA recognized the need for acute exposure guidelines for emergency response purposes and created the National Advisory Committee for Acute Exposure Guideline Levels (AEGLs) for Hazardous Substances. Currently, AEGLs are available for only a few substances

To overcome the absence of acute toxicity data for the purposes of human health risk assessment, several state regulatory agencies have suggested that guidelines developed for emergency purposes be used in the interim. Although suggestions have been made to use occupational exposure limits (OELs) by applying additional safety factors (References 14, 15), OELs were not used in this assessment because they introduce even more uncertainty than the use of emergency guidelines.

¹ Aliphatic hydrocarbons are hydrocarbons in which the carbon atoms are joined by single covalent bonds consisting of two shared electrons (e.g., butane). Aromatic hydrocarbons have ring structures (e.g., benzene) (Reference 13).

The OELs are designed to protect the workplace environment, and assume 8 hours per day, 5 days per week exposures. By definition, these exposures are more chronic than acute.

In comparison, emergency planning guidelines are more appropriate because they are typically developed for exposures of 1-hour or less. In addition, safety factors are included as part of the guideline development, so that the values would be protective of the general population.

Emergency Response Planning Guidelines (ERPGs) published by the American Industrial Hygiene Association (AIHA) (Reference 16) and the Temporary Emergency Exposure Limits (TEELs) developed by the U.S. Department of Energy (DOE) (Reference 17) were used for this assessment, specifically the ERPG-1s and the TEEL-1s. Since TEEL-1s are intended for exposures up to 15-minutes, air concentrations compared to TEELs were averaged over a 15-minute period. Air concentrations compared to ERPGs and AEGLs were averaged over 1-hour as these values are intended for 1-hour exposures.

For this assessment, the hierarchy of sources for ATV selection was as follows with each ATV defined below:

- ➤ EPA AEGL-1. "AEGL-1 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic, nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure."
- ➤ AIHA ERPG-1. "The maximum concentration in air below which it is believed nearly all individuals could be exposed for up to 1- hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor."
- ➤ DOE TEEL-1. "The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor."

AEGLs were used first when available since they are developed specifically for the purpose of acute exposure assessments. The ERPGs were selected next, prior to a substance's TEEL, because they are vigorously reviewed before they are published whereas the TEELs are not.

Example 6 shows a sample calculation of how a substance's estimated acute concentration was compared to its ATV using the aluminum concentration as an example.

Example 6

Sample Calculation Comparing a Substance's Estimated Acute Concentration to Its ATV:

$$\frac{C_{acute(AI)}}{ATV} = \frac{5.87E - 01}{3.00E + 04}$$
$$= 1.96E - 05 < 1$$

In this example with AI, the ratio is less than one, indicating that further evaluation is not necessary.

7. RISK CHARACTERIZATION

As previously described, the exposure assessment included calculations of time-averaged concentrations for both long-term (chronic) and short-term (acute) exposures. Using a screening approach, a substance's estimated time-averaged air concentration was then compared to chronic HBSLs or ATVs. The comparison was made using the ratio of the HBSL or ATV to the estimated concentration. This approach is conservative because the exposure assumptions used by the EPA, to establish HBSLs and ATVs, are likely to overestimate the exposures experienced by offsite residents living near firing ranges.

If this ratio was less than one, no further evaluation was needed. If the chronic or acute averaged concentrations (C_{chronic} and C_{acute}) were greater than the screening levels, resulting in a ratio greater than one, further evaluation would be warranted to determine the potential for health effects. Note that concentrations greater than the screening levels do not indicate an onset of health effects, but rather, the potential for such.

The chronic and acute assessments were conducted as outlined in Section 6.3. Appendix D presents results from the M882 risk characterization.

7.1 CHRONIC HEALTH RISK

The outcome of the chronic assessment indicated that no chronic health effects are expected from breathing the air emissions from the M882. Since the ratios for all substances were below one, further evaluation was not needed.

7.2 ACUTE HEALTH RISK

For the acute assessment, all ratios were below one indicating that no acute health effects are expected from breathing the air emissions from the M882. The ratios for all substances were below one, indicating that further evaluation was not necessary.

7.3 FACT SHEET

Appendix E includes a copy of the fact sheet submitted to the AEC. The fact sheet used results from this assessment to address health concerns related to inhalation of M882 air emissions.

8. UNCERTAINTY DISCUSSION

The limitations inherent in modeling and the added conservatism of the assessment contribute to the uncertainty of the assessment results. The risk assessment methodology typically includes safety factors that are embedded in the toxicity data to ensure adequate protection of the general population, particularly, susceptible individuals such as the sick, elderly, and children. Table 7 identifies areas of uncertainty associated with this assessment.

TABLE 7: TYPES OF UNCERTAINTY

Issue	Uncertainty	Direction of Effect
	Emissions Modeling	
Modeled versus real- time sampling	The air concentrations in this assessment were modeled. Actual air concentrations taken from the field may be higher or lower.	Varies
Frequency of use for the M882	Actual frequency of use for these munitions during training exercises may be different from those stated in this report.	Varies
Hypothetical offsite resident assumed to be located directly downwind	Unless the area around the training facility is populated, the chances that a person living directly downwind is low.	Overestimates
Use of worst-case meteorological conditions	To ensure that this assessment is applicable to most training areas, worst-case meteorological conditions were used in the air model.	Overestimates
	Exposure Assessment	1
Estimating time- averaged concentrations	Actual exposure from the M882 is intermittent. If one were to plot a person's exposure profile, the plot would consist of a series of spikes. Since current risk assessment methodology does not allow the evaluation of the potential for health risks as a function of time, a single concentration, averaged over the exposure duration was used. In this assessment, the exposure durations used were 30 years and 1-hour or 15 minutes.	Varies
Comparing estimated concentration to established screening levels	The Region 3 and Region 9 HBSLs were developed assuming that the resident is exposed 350 days per year. It is unlikely for training with the M882 to occur for 350 days per year at a particular firing range.	Overestimates
Comparing estimated concentrations to established screening levels	Comparison to screening levels does not account for possible cumulative effects of exposure to more than one substance.	Underestimates

TABLE 7: TYPES OF UNCERTAINTY

Issue	Uncertainty	Direction of Effect
Screening assessment versus calculating an average daily intake	Calculating an average daily intake allows the use of scenario-specific assumptions. However, unless the ratio of concentration to screening level approaches one, a screening assessment is useful as a first-cut evaluation.	Varies
Exposure to other munitions	Other munitions are typically used during the same training exercise. These items may contain similar or different substances from those detected in the M882.	Underestimates
	Toxicity Assessment	
Lack of toxicity data	Some substances were not quantitatively evaluated because they have no known toxicity data.	Underestimates
Modifying and uncertainty factors for toxicity data	Modifying factors and uncertainty factors of varying degree are typically applied to toxicological values. These factors are used to conservatively account for extrapolating from animal studies for human health evaluation, and to conservatively account for variation in human populations.	Overestimates

9. CONCLUSION

Using conservative assumptions, the assessment indicated that offsite residents who live as close as 100 meters directly downwind from training areas are safe from breathing air emissions from the M882. It is believed that the assumptions contained in this assessment are conservative enough to be protective of all the population including the sick, elderly, and children.

10. RECOMMENDATIONS

The results from this assessment are intended for a hypothetical training facility, and actual results may vary depending on site-specific conditions. This assessment used conservative assumptions (e.g., worst-case meteorological conditions, receptor located directly downwind, etc.) and it is believed that most site-specific analyses would result in even lower concentrations. Therefore, the results from this assessment should be applicable to most training facilities unless site-specific conditions vary significantly.

11. POINT OF CONTACT

Questions about this report may be directed to Ms. Joleen Mobley at (800) 222-9698 (ext 2953) or (410) 436-2953.

PREPARED BY:

APPROVED BY:

JOLEEN MOBLEY

Environmental Scientist

Environmental Health Risk Assessment

toleen Mobiley

DAVID L. DAUGHDRILL

Program Manager Environmental Health Risk Assessment

Program

STAFFORD D.F.R. COAKLEY

Environmental Engineer

Environmental Health Risk Assessment

Program

APPENDIX A
REFERENCES

- 1. U.S. Army (1994). *Technical Manual, Army Ammunition Data Sheets for Small Caliber Ammunition*. TM-43-0001-27.
- 2. U.S. Army (1988). Field Manual, Combat Training with Pistols & Revolvers, FM 23-35.
- 3. U.S. Army. Email communication between Ms. Tamera Clark-Rush, AEC, and Ms. Hsieng-Ye Chang, USACHPPM. Subject: Electronic copy of Firing Point Emission Study Series 3 Emission Factors, 16 August 2000.
- 4. USACHPPM (Aug. 2000). Ambient Air Quality Consultation NO. 43-EL-1485-00 Air Dispersion Modeling Evaluation For Military Munitions, Aberdeen Proving Ground, MD.
- 5. Bowman Environmental, Inc. (1999). *INPUFF2, Multiple Source Integrated Puff Model*, Version 4.1.
- 6. Title 40, Code of Federal Regulations, Part 68 (40 CFR 68), Chemical Accident Prevention Provisions, 1 July 1998.
- 7. U.S. Army. Email communication between Ms. Tamera Clark-Rush, AEC, and Ms. Hsieng-Ye Chang, USACHPPM. Subject: Scenarios (Small Caliber Ammunition), 12 September 2000.
- 8. Army Training Evaluation Protocol (ARTEP) 7-20-MTP, *Mission Training Plan for the Infantry Battalion*.
- 9. EPA (April 2000). Region 3 Risk Based Concentration (RBC) Tables. Available online at www.epa.gov/reghwmd/risk/riskmenu.htm
- 10.EPA (Nov. 2000). Region 9 Preliminary Remediation Goals (PRG). Available online at www.epa.gov/region09/waste/sfund/prg/index.html
- 11.EPA. National Ambient Air Quality Standards. Available online at http://www.epa.gov/ airprogm/airs/criteria.html
- 12. Total Petroleum Hydrocarbon Criteria Working Group (1997). *Development of Fraction Specific Reference Doses (RfDs) and Reference Concentrations (RfCs) for Total Petroleum Hydrocarbons (TPH)*, Volume 4. Amherst Scientific Publishers. Amherst, MA.
- 13. Manahan, Stanley (1994). *Environmental Chemistry*. Sixth edition. CRC Press, Inc. Boca Raton, FL.
- 14.U.S. Army (1996). Final Screening Risk Assessment for the Anniston Chemical Agent Disposal Facility at the Anniston Army Depot, Alabama. Revision No. 5. Prepared

- by the U.S. Army Center for Health Promotion and Preventive Medicine for the Program Manager for Chemical Demilitarization. Aberdeen Proving Ground, Maryland.
- 15.U.S. Army (1997). Final Screening Risk Assessment for the Pine Bluff Chemical Agent Disposal Facility at the Pine Bluff Arsenal, Arkansas. Revision No. 1. Prepared by the U.S. Army Center for Health Promotion and Preventive Medicine for the Program Manager for Chemical Demilitarization. Aberdeen Proving Ground, Maryland.
- 16. American Industrial Hygiene Association (AIHA) (1999). *Emergency Response Planning Guidelines*. AIHA Press, Fairfax, VA.
- 17. Department of Energy (1998). *Temporary Emergency Exposure Limits*, Revision 15. http://www.scapa.bnl.gov.

APPENDIX B AIR DISPERSION MODELING OUTPUT DATA

Table B-1: Air Modeling Output Data for the Cartridge, 9MM Ball, M882 (M9)

		Cartridge, 9-mm, Ball, M882 (M9)	M882 (M9)	1 1	No of rounds (I)		round
	Net Ex	Net Explosive Weldh: N E.M. n.s.	VIIIS (08(6C) =>			3.00	seconds
			SE CROWN		8.31 E-04 Unit Concentration (UC):	2:081E:04 g/m /(g/s)	(s/6)/, uu/6
	AIC		lits	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	· · · · · · · · · · · · · · · · · · ·		
	Average	Daily	Average	Average	Total Mass	Substance	Cilhatanao
	Measured	Measured	Adjusted	Adjusted	of Substance.	Concentration	Emission
(Actual	Background	Emission	Emission	Emitted	CNCC	Dele /ED
Compound	Concentration	Concentration	Factor (EF)	Factor	(drams//fam)	(arome(m ³).	ואמום וביעיו
	(mg/m³)	(mg/m ₃)	(lb/ltem)	(Ib/Ib NEW)		Value/III)	oes/(waji/8eo
Permanent Gases					And the state of t	THE PROPERTY OF	
Ammonia (NH3)	6.65E+00	NA	2 04F 06	2 455 02	San		The state of the s
Carbon Dioxide (CO2)	6.53E+02	NA	2 00E-04	2.43E-03	9.251E-04	9.533E-08	4.625E-04
Carbon Monoxide (CO)	1.00E+03	NA	3 07E 04	2.415-01	9.090E-02	9.367E-06	4.545E-02
Oxides of Nitrogen (NOx)	3.20E+01	MA	0.07	3.09E-01	1.392E-01	1.434E-05	6.959E-02
Sulfur Dioxide (SO2)	2.62E-01	NA	9.03E-00	1.18E-02	4.457E-03	4.593E-07	2.229E-03
Acid Gases			0.045-00	9.0/E-U5	3.645E-05	3.756E-09	1.822E-05
Hydrogen Fluoride	2 50E.01	2 30E 04					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Hydrogen Chloride	2 40F-01	2 20E 04	2 4	Q.	QN	QN	QN
Hydrogen Bromide	2 40E 04	4.40E-01	2	QN	QN	QN	S
Nitric Acid	5 40E 04	4.20E-01	QN	2	QN	S	S
Phosphoric Acid	2.405-01	Z.20E-01	2.87E-07	3.45E-04	1.300E-04	1.340F-08	8 501E OF
Sulfurio Acid	2.40E-01	2.20E-01	S	QN	QN	QN	SOLUTION OF THE PROPERTY OF TH
Cvanida	Z.30E-01	Z.20E-01	8.75E-08	1.05E-04	3.970E-05	4.091E-09	1 985E-05
Particulate Cvanide	, 00 TOC ,						00-1000
Hydrogen Cyanida	1.20E-02	1.20E-02	ON	Q	QN	CN	
Particulator	5.20E+00	1.30E-02	1.82E-06	2.19E-03	8.249E-04	R 501E-08	NO V
Total Supponded Destantation			See See See			00-31 00:0	4.125E-04
Particulate Matter 40	6.04E+01	NA	2.11E-05	2.54E-02	9.576E-03	O REBE 07	4 7001 00
Particulate Matter 22 F	6.82E+01	۷A	2.38E-05	2.87E-02	1.081E-02	1 114E OB	4.700E-U3
Motals	5.81E+01	NA	2.03E-05	2.44E-02	9.214E-03	0 4955.07	3.400E-U3
Aliminim	The state of the s		4.6			0.1000	4.007 E-U3
Antimony	2.02E-01	5.50E-02	7.07E-08	8.50E-05	3.207E-05	3 305 00	1 6001
Areanio	5.83E+00	5.50E-02	2.04E-06	2.45E-03	9.246E-04	0.505E-09	1.603E-05
	1.63E-02	1.37E-02	6.81E-09	8.19E-06	3 0895-06	3.320E-U0	4.023E-U4
barium	5.03E+00	5.50E-02	1.76E-06	2.11E-03	7 0735 04	3.183E-10	1.544E-06
Beryllium	5.18E-02	5.50E-02	CN	CN	PO-TO-TO-TO-TO-TO-TO-TO-TO-TO-TO-TO-TO-TO	8.216E-08	3.986E-04
Cadmium	5.18E-02	5.50E-02	GN	S	02/2	Q.	QN
Calcium	5.54E-01	4.32E-01	6.14E-08	7.39E-05	2 78GE OF	ON CO	2
Correlation	5.18E-02	5.50E-02	QN ON	Q	CN	2.07 IE-U9	1.393E-05
Cobait	5.18E-02	5.50E-02	QN	S		2	QN
					7	QQ.	ΩN

Table B-1: Air Modeling Output Data for the Cartridge, 9MM Bail, M882 (M9)

		A CIFITING THAT RESULTS	ults	***			
	Average	COBIIV	Average	Average	Total Maco		
	Measured	Measured	Adjusted	Adjusted	of Substance	Concording	Substance
Composition	Actual	, Background	Emission	Emission	Emilled	(GONC)	Hafe (ED)
	Concentration	Concentration	Factor (EF	Factor	(grams/ilem)	(orams/m³)	לעיווס (ובעל)
Copper	(mg/m;)	, (mg/m²)	(lb/ltem)	(IB/IB NEW)			398///gill///36C
l pad	2.93E+00	9.82E-02	9.93E-07	1.19E-03	4 505E-04	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Magnorium	1.96E+01	5.50E-02	6.84E-06	8 23F-03	3 4045 03	4.643E-08	2.253E-04
Magriesium	5.18E-02	5.50E-02	CN	CIN CIN	3.101E-03	3.196E-07	1.551E-03
Wanganese	5.18E-02	5.50E-02	S		QN	Q.	QN
Nickel	5.18E-02	5.50E-02	S	QV CIV	QN	ND	QN
Selenium	1.29E-02	1.37E-02		ON	QN	Q.	QN
Silver	5.18E-02	5 50E-02	2 2	2	NO	QN	QN
Thallium	5 18F-02	5 EOE 02	2	QN	QN	QN	S
Vanadium	5.18E-02	5.50E-02	2	QN	ND	9	S
Zinc	4 72F.01	E EOF 00	ON.	QN	QN	Q	2
TO:11 Carbonyls	0-37.7	9.30E-02	1.65E-07	1.98E-04	7.479E-05	7.707E-09	3 730E OF
Formaldehyde	1 47E-01	1 005					0.1091-03
Acetaldehyde	1 80E-04	1.435-UI	5.15E-08	6.20E-05	2.338E-05	2.409F-09	1 1600 05
Acetone	1 19F+00	1.00E-01	2	Ω Q	QN	GN	ND CIN
Acrolein	2 20E 02	1.195.400	QN	QN	QN	SN	2 2
Proprionaldehyde	2.2.5E-02	2.29E-01	8.02E-09	9.65E-06	3.640E-06	3.751E-10	1 820E 0e
Crotonaldehyde	2.87F-01	2 875 04	Q.	Q	QN	9	N CN
Butyraidehyde	2 95F-01	2 06 04	2	Q	QN	QN.	S
Benzaldehyde	4.34F-01	4.30E-01	QN	QN	QN	QN	
Isovaleraldehyde	3.52F-01	3 505 04	Q	Q	QN	QN	S S
Valeraldehyde	3.52E-01	3.52E-01	2 2	QN .	QN	QN	CN CN
o,m,p-Tolualdehyde	4.91E-01	4 91E.01	2 2	2	ND	QV	CN
Hexaldehyde	4.10E-01	4 10F-01	2 2	2	QN	QN	2
2,5-Dimethylbenzaldehyde	4.10E-01	4 10F-01	2 2	2	QN	QN.	QN
VOCS			ON.	Q.	ND	QN.	CN
Propene	3.53E-01	1 72E.03	1 200 02				
Dichlorodiflouromethane	2.47E-03	1.98F-03	2 34E 40	1.44E-04	5.443E-05	5.609E-09	2.721E-05
Chlorodifluoromethane	3.54E-03	3.54E-03	4.34E-10	2.81E-0/	1.060E-07	1.092E-11	5.299E-08
reon 114	6.99E-03	6.99E-03	2 2	2 2	QN	Q	QN
Chloromethane	8.26E-04	8.26E-04	3 00E-11	ND 284E 00	QN	QN	QN
Vinyl Chloride	2.56E-03	2.56E-03	GN	3.0 IE-08	1.362E-08	1.404E-12	6.812E-09
1,3-Butadiene	6.64E-03	2.21E-03	2.28E-09	2 7 AE 0e	ON	QN	N ON
Bromomethane	3.88E-03	3.88E-03	CN	7.74E-00	1.033E-06	1.064E-10	5.164E-07
				Q.	QN	QV	GN

Table B-1: Air Modeling Output Data for the Cartridge, 9MM Ball, M882 (M9)

•	AT	ATC Firing Test Results	Ilts				
	Average	Daller					.,
	Measured	Menatitad	Average	Average	Total Mass	Substance	Substance
	Actual	Bartine	Calculated	Adjusted	of Substance	Concentration	Emission
Compound	Concentration	Daviglourid	Emission	Emission	Emilied	(CONC)	Rate (ER4)
		Collicentration	racior (EF)	Factor	(grams/item)	(grams/m³)	(g/ilem)/sec
Chloroothono	(m/g/m)	(mg/m²)	(Ib/item)	(Ib/Ib NEW)			
Dichloralliane	2.64E-03	2.64E-03	QN	ΩN	CN	UN.	
Trickle	4.21E-03	4.21E-03	QV	QN	CN	ON S	2
Trentororromethane	1.40E-03	1.69E-03	QN	CN		ON.	Q
Pentane	2.80E-03	2.95E-03	9.52E-10	1 15E OR	UN 1 240 F 0 2	QN	QN
Acrolein	2.64E-01	2.29E-03	8 ORE-OR	1.135-00	4.319E-U/	4.451E-11	2.160E-07
1,1-Dichlorethene	4.05E-03	4.05E-03	ND	1.00E-04	4.063E-05	4.187E-09	2.032E-05
Freon 113	7.68E-03	7.68E-03	S S	2 2	ON	QN	QN
Acetone	2.17E+00	1 07E-01	7 405 07	ON C	QN	QN	Q
Methyl lodide	5.81E-03	5.845.03	/. IOE-U/	8.35E-04	3.222E-04	3.320E-08	1.611E-04
Carbon Disulfide	4.67F-03	3 445 00	ON LOS	ON I	ND	Q	QN
Acetonitrile	1.31F-01	1 ARE 02	1.305-09	1.90E-06	7.177 E- 07	7.396E-11	3.589E-07
3-Chloropropene	3.13E-03	3 13E-03	4.43E-00	5.35E-U5	2.018E-05	2.080E-09	1.009E-05
Methylene Chloride	6.79E-01	2 435.02	ND C	UND 10101	QN	ND	QN
tert-Butyl Alcohol	3.03E-03	6 OBE-03	4.43E-07	Z./0E-04	1.020E-04	1.051E-08	5.099E-05
Acrylonitrile	6.40E-02	2 17E-03	ND 7 48F 00	ON S	QN	QN	QN
trans-1,2-Dichloroethene	3.96E-03	3 96E-03	2. 10E-00	4.0ZE-U5	9.867E-06	1.017E-09	4.934E-06
Methyl t-Butyl Ether	3.61E-03	3 R4E 03	2	2	QN	QN	2
Hexane	1.18E+00	4 58E-02	ND SOF	CN 188	QN	QN	QN
1,1-Dichloroethane	3.97E-03	3 97E-02	S. OSE-U/	4.08E-04	1.766E-04	1.820E-08	8.832E-05
Vinyl Acetate	3.52E-03	3.57E-03			QN	QN	S
cis-1,2-Dichtoroethene	3.96E-03	3 96E-03	2 2	2	ND	QN	QN
2-Butanone	5.60E-03	2.05E-03	ND TOO	NO L	ND	QN	QN
Ethyl Acetate	7.21E-03	3.60E-03	1.09E-09	2.28E-06	8.591E-07	8.853E-11	4.296E-07
Methyl Acrylate	3.52E-03	3.52E-03	200	4.30E-00	1.111E-06	1.145E-10	5.555E-07
Chloroform	4.88E-03	4.88E-03	2 2		QN	QN	ND
1,1,1-Trichloroethane	3.27E-03	3.27E-03	1 12E 10	1 26 1 03	ON	QN	QN
Carbon Tetrachloride	6.29E-03	6.29F-03		10-30E-07	5.083E-08	5.238E-12	2.542E-08
1,2-Dichlorethane	8.09E-03	4.05F.03	2755.00	ND S	QN	QN	QN
Benzene	5.59E-01	3 20F-03	1 00 0 02	0.315-00	1.248E-06	1.286E-10	6.239E-07
Isooctane	4.67E-03	4 67F.03	NP NP	4.29E-04	8.622E-05	8.885E-09	4.311E-05
Heptane	2.05E-03	4 10E-03	7 035 40	UN C	QN	QN	QN
Trichloroethane	4.88E-03	4 BBE-03	ND -100	0.40E-U/	3.188E-07	3.286E-11	1.594E-07
Ethyl Acrylate	4.09E-03	4 DQE-03	2 2	2	QN	QN	QN
		1:00E-00	2	ב	S	2	

Table B-1: Air Modeling Output Data for the Cartridge, 9MM Ball, M882 (M9)

	AT	ATC Firing Test Results	114.				
	Averene						
	Mananisad	Vally	Average	Average	Total Mass	Substance	Substance
		Deinspan	Adjusted	Adjusted	of Substarice	Concentration	Embelon
	WCIUBI.	Background	Emission	Emission	2		TO SECTION OF THE PARTY OF THE
compound	Concentration	Concentration	Factor (EF)	, C. T. II.			(FXII) (BX-)
	(mg/m³)	(ma/m ₂)	(lb/ilem)	JIH NEW	(Viams/lem)	(grams/m²)	(g/ttem)/sec
1,2-Dichloropropane	4.62E-03	4 62F-03	OIV	1	The state of the s		
Methyl Methacrylate	4.09F-03	A DOE OS	2 2	Q.	ON	QN	QN
Dibromomethane	7 115-03	7.44F 00	QN:	Q	ND	QN	CZ
1,4-Dioxane	2 605 00	7.115-03	QN	QN	QN	GN	CIA
Bromodichloromothers	3.00E-U3	3.60E-03	Q	QN	QN		2
A Modern 2 B	6.70E-03	6.70E-03	QN	2	CN	QN.	2
4-IVIETINJI-Z-Pentanone	4.10E-03	4.10E-03	S	Ş		QN	Q
l oluene	8.86E-02	3.77E-03	3.01E-08	3 825 08	UN COLL	Q	QN
Octane	4.67E-03	4.67E-03	2	0.02E-03	1.365E-U5	1.407E-09	6.825E-06
trans-1,3-Dichloropropene	4.54E-03	4.54E-03	2 2	2 2	QN	QN	QN
Ethyl Methacrylate	4.67E-03	4.67E-03	2		QN	QN	QN
1,1,2-Trichloroethane	5.46E-03	5.46F-03		2	QN.	QN	QN
Tertrachloroethene	6.78E-03	6 78E-03			QN	Q	Q.
2-Hexanone	4 10E-03	4 40 00	QN.	2	QN	QN.	CN
Dibromochloromethane	8 52E-03	4. IOE-US	2	2	QN	QN	S
1,2-Dibromoethane	7 685 00	0.02E-03	Q	Q	ND	CZ	
Chlorobenzene	7.00E-03	7.68E-03	2	Q	QN	S	2 2
1112 Totrachloroothers	4.00E-U3	4.60E-03	2	9	CN		3
Ethylbonzono	6.87E-03	6.87E-03	QN	QN	CN	QN S	Q.
m/n Vulgar	4.34E-03	4.34E-03	1.48E-09	1.78E-06	8 ROJE 07	ON C	QN
nip-Aylene o Xilina	1.30E-02	4.34E-03	4.43E-09	5.33F-06	2 008E 08	6.898E-11	3.347E-07
0-Ayrene	8.68E-03	4.34E-03	2.95E-09	3.55E-06	1 230E 06	2.069E-10	1.004E-06
Siylene	5.96E-03	4.26E-03	2.04E-09	2 45E-08	00-386-0	1.380E-10	6.694E-07
bromororm	1.03E-02	1.03E-02	QN	SIC	9.231E-U/	9.513E-11	4.616E-07
Curriene	4.92E-03	4.92E-03	2	S	ON W	QN	QN
I, I, Z, Z- I etrachlorethane	6.87E-03	6.87E-03	Q	2	ON NO	Q	Q
1,2,3-Irichloropropane	6.03E-03	6.03E-03	S		ON .	QN	9
Bromobenzene	6.42E-03	6.42F-03	2 2	2 2	QN	QN	S
4-Ethyltoluene	1.97E-03	4 97F-03	S GBE 40	UND O	QN	QN	Q.
1,3,5-Trimethylbenzene	4.92E-03	4 92F-03	NO.	0.046-07	3.031E-07	3.124E-11	1.516E-07
Alpha Methyl Styrene	4.83E-03	4.83F-03			QN	QN	QV
1,2,4-Trimethylbenzene	2.46E-03	4.92F-03	8 35E 40	NO TOO	QN	QN	QN
1,3-Dichlorobenzene	6.01E-03	6.01E-03	ND - 10	1.00E-05	3.789E-07	3.905E-11	1.895E-07
1,4-Dichlorobenzene	6.01E-03	6.01F-03	2 2		QN	ON	QN
Benzyl Chloride	5.18E-03	5 18E.03	2 2		ND	QN	QN
		0.101.00	ON	ON ON	ON	S	S

Table B-1: Air Modeling Output Data for the Cartridge, 9MM Ball, M882 (M9)

	ATC	ATC Firther Test Requite	1101				
		200					
	Average	Cally	Average	Average	Total Mass	Sirbstance	Circleding
	Measured	Measured	Adjusted	Adjusted	of Substance	Concentration	Eminologica
	Actual	Background	Emission	Emission	Emiliad		Code ven
Compound	Concentration	Concentration	Factor (EF)	Factor	(orame/ilam)	(2)(2)	(Fue) alex
	(mg/m³)	(mg/m³).	(lb/item)	(Ib/Ib NEW)			(g/item)/sec
1,2-Dichlorobenzene	6.01E-03	6.01E-03	QN	CN	ON ON		
Hexachlorethane	9.68E-03	9.68E-03	GN	2		ON.	QN
1,2,4-Trichlorobenzene	7.42E-03	7.42E-03	S			QN	ΩN
Hexachlorobutadiene		1.07E-02	2			QN	QN
VOC Tentatively Identified Compo	ounds (TICs)			2		QN	QN
Hydrocarbons				1.00			
Methane	5.38E+00	1.33E+00	1 47E-08	1 775 03	10000		
Ethylene	1.46E+00	2.29E-02	5 10E-07	6 12E 04	0.5865-04	6.890E-08	3.343E-04
Acetylene	6.18E-01	2.13E-02	2.16E-07	2 805 04	Z.311E-04	2.382E-08	1.156E-04
Ethane	2.53E-01	2.46E-02	8 84F-08	1 OFF 04	9.807 E-05	1.011E-08	4.903E-05
Propylene	4.29E-01	3.44F.02	1 505 07	1 045 04	4.009E-05	4.131E-09	2.004E-05
Propane	4.96E-02	3.61E-02	1 73E-08	2 00E 0E	5.811E-05	7.019E-09	3.406E-05
Propyne	6.00E-02	3.20E-02	2 10F-08	2 52E-05	7.809E-Ub	8.109E-10	3.934E-06
Isobutane	4.75E-02	4.75E-02	GN	NID	9.513E-06	9.803E-10	4.756E-06
1-Butene/Isobutylene	1.45E-01	4.59E-02	5 ORF.OR	A OBE OF	UNI Trock	Q	ND
1,3-Butadiene/butane	6.88E-02	6.88E-02	S	NO	Z.Z34E-U3	2.364E-09	1.147E-05
cis-butene	4.59E-02	4.59E-02	CN	2 2	ON C	9	QN
1-Butyne	4.59E-02	4 59E.02	9 5	2 2	ON	Ω	QN
trans-Butene	4.59E-02	4 59F-02	2 2	2 2	QN	Q.	ND
2-Butyne	4.42E-02	4 42E.02		2 2	QN	ND	ΩN
n-Pentane	5.90E-02	5 90F.02	2 2	2 2	QN	QN	QN
n-Hexane	1.39E+00	7.05E-02	4 RSE-07	ND E BAE OA	ON	QN	ND
SVOCs			1.001	0.046-04	Z.Z01E-04	2.268E-08	1.100E-04
N-nitrosodimethylamine	1.70E-02	1.83E-02	CN	CN	ON ON		
Bis(2-chloroethyl)ether	1.70E-02	1.83E-02	S S			QN	QN
Phenol	1.70E-02	1 83E-02		2 2	ON I	2	QN
2-chlorophenol	1.70E-02	1.83E-02	2 2	2 5	ON.	Ω	QN
1,3-dichlorobenzene	1.70E-02	1.83E-02	2 2	2 2		Q	Q
1,4-dichlorobenzene	1.70E-02	1.83E-02	S		ON N	QN.	QN
1,2-dichlorobenzene	1.70E-02	1.83E-02	S	2 2		Q	QN
Benzyl alcohol	1.70E-02	1.83E-02	QN	CN		QN	ΩN
BIS(2-chloroisopropyl)ether	1.70E-02	1.83E-02	QN	QN		2 5	GN
2-methylphenol	1.70E-02	1.83E-02	CN	CZ		2	QN
		,		2	ביי	_ 	S

B-6

Table B-1: Air Modeling Output Data for the Cartridge, 9MM Ball, M882 (M9)

	3						
	Average	Viele State	Aibrana				
•	Meagurad	Market	- Werage	Average	TotaliMass	Substance	Substance
•	Delines on	Deinseam	Adjusted	Adjusted	of Substance	Concentration	Emission
	ACIUMI	Dackground	Emission	Emission	Emilled	CONCO	balo (EB
Dunodulo	Concentration	Concentration	Facilor (EF)	Factor	Oramella		יימום וכיאלו
The second secon	(mg/m ²)	(mom)	(lb//tem):	(In/In NEW)	All miles (All miles)	(grams/m)	(g/item)/sec
Hexachloroethane	1.70E-02	1 83E-02	CN	4			
N-nitroso-di-n-propylamine	1 70E-02	1 825 00	Q.	ON!	QN	QN	QN
4-methylphenol	1 705 00	1.03E-02	2	. QN	QN	QN	S
Nitrohenzene	1.70E-02	1.83E-02	Q	ΩN	QN	CN CN	
Conhorate	1.70E-02	1.83E-02	QN	Q.	S	2	QN.
Isopriore	1.70E-02	1.83E-02	QN	CN		Q .	QN
z-nitropnenoi	1.70E-02	1.83E-02	QN	S		QN.	QN
z,4-dimethylphenol	1.70E-02	1.83E-02	CN	2	000	Q	Q.
Bis(2-chloroethoxy)methane	1.70E-02	1.83E-02	CN	2 2	2	QN	QN
2,4-dichlorophenol	1.70E-02	1.83E-02	2	2 2	ON	Q	ND
1,2,4-trichlorobenzene	1.70E-02	1 83E_02	2 2	2 5	NO	S	QN
Naphthalene	1.84F-02	1 835 02	ON C	ON IS	QN	QN	QN N
4-chloroaniline	1 70F-02	1 825 00	0.73E-09	8.10E-06	3.053E-06	3.146E-10	1.526E-08
Hexachlorobutadiene	1 70E-02	1 025 02	2	Q	QN	S	GN
4-chloro-3-methylphenol	1 70E.02	1.03E-02		Q	ND	QN	QN
2-methylnaphthalene	1 70E 00	1.03E-02	QN.	QN	QN	QN	CN
Hexachlorocyclopentadiene	1 70E-02	1.83E-02	Q !	Q	QN	QN	CN
2,4,6-trichlorophenol	1.70E-02	1.03E-UZ	Q	Q	QN	GN	CIN
2,4,5-trichlorophenol	1.70E-02	1.83E-02	<u>Q</u>	ND	ND	QN	2 2
2-chloronanhthalana	1.705-02	1.83≿-02	QN	QN	QN	CN	
2-nitroaniline	1.70E-02	1.83E-02	DN	QN ON	QN		2 2
Acenanhthylene	1.70E-02	1.83E-02	QN	QN	QN	2 2	
Oimethyliphthalata	1.70E-02	1.83E-02	QN	QN	QN		2 2
2 A-dinitrotolunas	1.70E-02	1.83E-02	QN	QN	QN		2
Acensabitions	1.70E-02	1.83E-02	QN	QN.	CZ	2 2	2
2 pleasilies	1.70E-02	1.83E-02	2	Q.	S	2 4	Q.
Thu Danilline	3.40E-02	3.67E-02	QN	GN		Q.	Q
z,4-dinitrophenoi	3.40E-02	3.67E-02	QV	200		ON L	Q
Diberizoluran	1.70E-02	1.83E-02	QN ON	CN			Q N
z,4-dinitrotoluene	1.70E-02	1.83E-02	GN	S	G. Z	Q	Q
4-nitrophenol	3.40E-02	3.67E-02	CN CN	2 2	ON	Q	ON D
luorene	1.70E-02	1.83F-02	C N		ON	QN	QN ON
4-chlorophenyl-phenylether	1.70E-02	1.83F-02			GN	ND	QN
Diethylphthalate	1.70E-02	1 83E-02	2 5	2 2	QN.	QN	QN
4-nitroaniline	3.40F-02	3 675 00	2 2	2	ND	QN	CN
	70 70	3.01 E-02	ב				

Table B-1: Air Modeling Output Data for the Cartridge, 9MM Ball, M882 (M9)

Compound Average record Average record between the sealined for the		* Y	1					
Compound Advantage south problems Advantage south problem			Sex 1881 Bullion	ılts				
Compound		Wyel age	Daily	Average	Average	Total Man	4	
Compound Adual (mg/m) Background (mg/m) Entilision (granishin) Concentration (chick) Entilision (granishin) Concentration (granishin) Concentration (mg/m) MD ND		Measured	Measured	Adjusted	Adillalad	Of Cultain	Subs(ance	Substance
Compound Concentration Concentration Concentration Concentration Factor (EF)	. (Actual	Background	Emission	Emission	ano no n	Concentration	Emission
Intro-2-metatyphenol (Ingina) (Ingina)<	Compound	Concentration	Concentration	Factor /FF	E STORY OF THE STO	Emilled	(CONC)	Rate (ER,)
Indicative properties 3.46E-02 3.67E-02 NO ND ND ND ND ND ND ND		(ma/m³)	(majm)	(In the state of	1000	(grams/item)	(grams/m³)	(n/illem)/eac
170E-02 183E-02 ND ND ND ND ND ND ND N	4,6-dinitro-2-methylphenol	3 40 = 00	Linguis C	(IO/IIIBm)	(ID/ID, NEW)			Open Hower
ropinople principle of the problem of the principle of the problem of the principle o	N-nitrosodiphenylamine(1)	1 705 00	3.6/E-02	QN	QN	UN.		
1.70E-02 188E-02 ND ND ND ND ND ND ND N	4-bromophenyl-phenylether	1.705-02	1.83E-02	ND	9	QN N	ON.	QN
A	Hexachlorobonzone	1.705-02	1.83E-02	2	CN	ON C	Q	QN
Influence 3.6TE-02 3.6TE-02 ND ND ND ND Influence 1.70E-02 1.83E-02 ND ND ND ND Influence 1.70E-02 1.83E-02 <td>Domonia Operice IIe</td> <td>1.70E-02</td> <td>1.83E-02</td> <td>S</td> <td></td> <td>QN</td> <td>S</td> <td>CN</td>	Domonia Operice IIe	1.70E-02	1.83E-02	S		QN	S	CN
Inflittene 1,70E-02 1,33E-02 ND ND ND ND Inflittene 1,70E-02 1,83E-02 ND ND ND ND Alphorablidate 1,70E-02 1,83E-02 ND ND ND ND Alpflorablidate 1,70E	r entachiorophenol	3.40E-02	3 67E-02		2	QN	S	
Utypithalate 1,70E-02 1,83E-02 ND ND ND ND Utypithalate 1,70E-02 1,83E-02 ND ND ND ND Intypithalate 1,70E-02 1,83E-02 ND ND ND ND Intypithalate 1,70E-02 1,83E-02 ND ND ND ND Intypithalate 1,70E-02 1,83E-02 ND ND ND ND Inthrocene 1,70E-02	Phenanthrene	1.70F-02	1 825 02	QN	Q	QN	2 2	CINI
utyliphthalate 1.70E-02 1.83E-02 ND ND ND ND nihene 1.70E-02 1.83E-02 ND ND ND ND ND enzylphthalate 1.70E-02 1.83E-02 ND ND ND ND enzylphthalate 1.70E-02 1.83E-02 ND ND ND ND enzylphthalate 1.70E-02 1.83E-02 ND ND ND ND phlorobraidine 1.70E-02 1.83E-02 ND ND ND ND phlororanthene 1.70E-02 1.83E-02 ND ND ND ND phlororanthene 1.70E-02 1.83E-02 ND ND ND ND <t< td=""><td>Anthracene</td><td>1 70E 02</td><td>1.03E-02</td><td>QN</td><td>QN</td><td>QN</td><td>QN 2</td><td>QN</td></t<>	Anthracene	1 70E 02	1.03E-02	QN	QN	QN	QN 2	QN
rithene 1,70E-02 1,83E-02 ND ND ND ND enzylphthalate 1,70E-02 1,83E-02 ND ND ND ND enzylphthalate 1,70E-02 1,83E-02 ND ND ND ND folamthracene 1,70E-02 1,83E-02 ND ND ND ND b/illocanthene 1,70E-02 1,83E-02 ND ND ND ND sittloranthene 1,70E-02 1,83E-02 ND ND ND ND sittloranthene 1,70E-02 1,83E-02 ND ND ND ND sittloranthene	Di-n-butylphthalate	1.705-02	1.83E-02	QN	₽ P		QN.	Q
1.70E-02 1.80E-02 ND ND ND ND ND	Fluoranthene	1.70E-UZ	1.83E-02	QN	Q.	Q. N	QN	Q
Enzylphthalate 1.70E-02 1.88E-02 ND ND ND ND (a)anthracene 1.70E-02 1.88E-02 ND ND ND ND a) Inchenzidine 1.70E-02 1.83E-02 ND ND ND ND Allorobenzidine 1.70E-02 1.83E-02 ND ND ND ND Allorophylinthalate 1.70E-02 1.83E-02 ND ND ND ND <tr< td=""><td>Pyrene</td><td>1.70E-02</td><td>1.83E-02</td><td>S</td><td>CZ</td><td>ON NO</td><td>QN</td><td>2</td></tr<>	Pyrene	1.70E-02	1.83E-02	S	CZ	ON NO	QN	2
(a) introduced (a) introduced (b) introduced (c) in	Butulbenzylabtholote	1.70E-02	1.83E-02	2	2	ON.	Q	QN
Application	Bonzo(c) cult	1.70E-02	1.83E-02	S		QN	2	CN
Any Informed and Experimental Information of Experiment And Informed and Information of Experiment And Informed and Information of Experiment And Informed and Information of Experiment And Information of Info	Deliza(a/alitifacene	1.70E-02	1.83E-02			QN	Ð	SN
All principalities 1.70E-02 1.83E-02 ND ND ND ND Althylhexylpinthalate 3.73E-02 4.95E-02 ND ND <td>Ciliysene</td> <td>1.70E-02</td> <td>1.83F-02</td> <td>2 2</td> <td>2</td> <td>QN</td> <td>S</td> <td>Ę</td>	Ciliysene	1.70E-02	1.83F-02	2 2	2	QN	S	Ę
tiplythexyliphthalate 3.73E-02 4.95E-02 ND ND ND ND Ulphthalate 1.70E-02 1.83E-02 ND ND ND ND ND Diffucranthene 1.70E-02 1.83E-02 ND ND ND ND Alpyrene 1.0E-02<	3,3-dichlorobenzidine	1.70E-02	1 83E_02	2 4	2	QN	SN	2 2
Sylphthalate 1,70E-02 1,38E-02 ND ND ND ND b/flucranthene 1,70E-02 1,83E-02 ND ND ND ND A)p/roranthene 1,70E-02 1,83E-02 ND ND ND ND A)p/yene 1,70E-02 1,83E-02 ND ND ND ND A)p/yene 1,70E-02 1,83E-02 ND ND ND ND A(1,2,3-cd)pyrene 1,70E-02 1,83E-02 ND ND ND ND A(1,2,3-cd)pyrene 1,70E-02 1,83E-02 ND ND ND ND A(1,2,3-cd)pyrene 1,70E-02 1,83E-02 ND ND ND ND A(1,1)partylene 1,70E-02 1,83E-02 ND ND ND ND A(1,1)partylene 1,0E-04 2,7EE-05 3,7EE-09 3,82E-06 1,439E-06 1,74E-11 A(1,1)partylene 1,0E-04 1,83E-03 3,7EE-10 3,0EE-07 1,146E-07 1,74E-11<	Bis(2-ethylhexyl)phthalate	3.73E-02	4 OFF 02	Q.	QN	QŅ	CN	ON.
Diffucion thene 1.70E-02 1.83E-02 ND ND ND ND ND ND ND N	Di-n-octylphthalate	1.70F-02	4.30E-02	2	QN	ON.		2
k/fluoranthene 1.70E-02 1.83E-02 ND ND ND ND alpyrene 1.70E-02 1.83E-02 ND ND ND ND ND (1.2.3-cd/pyrene 1.70E-02 1.83E-02 ND ND ND ND (a,b)anthracene 1.70E-02 1.83E-02 ND ND ND ND g,h,l)perylene 1.70E-02 1.83E-02 ND ND ND ND g,h,l)perylene 1.70E-02 1.83E-02 ND ND ND ND Pertatively Identified Compounds (7TCs) 1.83E-02 ND ND ND ND Inhylene 1.04E-02 1.26E-03 3.17E-09 3.82E-06 1.439E-06 1.439E-06 Inthrene 3.54E-04 2.76E-05 2.51E-10 3.0E-05 1.11E-10 1.33E-07 1.146E-07 1.181E-11 ene 1.35E-05 3.96E-11 4.79E-08 1.806E-09 1.861E-12 ihrene 1.36E-05 2.53E-10 3.04E-07	Benzo(b)fluoranthene	1 705 02	1.03E-02	2	2	GN CN	2 2	ND
a)byvene 1,70E-02 1,83E-02 ND ND ND ND (1,2,3-cd)pyrene 1,70E-02 1,83E-02 ND ND ND ND (a,h)anthracene 1,70E-02 1,83E-02 ND ND ND ND g,h,l)perylene 1,70E-02 1,83E-02 ND ND ND ND 1,milloevylene 1,70E-02 1,83E-02 ND ND ND ND 1,milloevylene 1,70E-02 1,83E-02 ND ND ND ND PAHSI 1,04E-02 1,28E-03 3,17E-09 3,82E-06 1,438E-07 1,7483E-10 hthylene 1,04E-02 1,28E-03 3,76E-11 4,51E-08 1,699E-08 1,781E-12 hthylene 3,54E-04 2,75E-05 2,53E-06 1,33E-07 1,49E-08 1,781E-12 ene 1,17E-04 1,83E-05 3,96E-07 1,49E-08 1,806E-09 1,861E-07 thene 1,34E-03 3,12E-05 2,64E-07 2,090E-07	Benzo(k)fluoranthene	1 705 00	1.83E-02	QN	QN	CN	2	QN
(1.2,3-cd)pyrene 1,70E-02 1,83E-02 ND ND ND ND (a, l)anthracene 1,70E-02 1,83E-02 ND ND ND ND ND (a, l)parthracene 1,70E-02 1,83E-02 ND ND ND ND (a, l)parthracene 1,70E-02 1,83E-02 ND ND ND ND (a, l)parthracene 1,70E-02 1,83E-02 ND ND ND ND (a, l)parthracene 1,04E-02 1,28E-03 3,17E-09 3,82E-06 1,439E-06 1,483E-10 alene 1,10E-04 1,83E-05 3,75E-11 4,51E-09 1,699E-08 1,751E-12 threne 3,54E-04 3,30E-05 1,11E-10 3,34E-06 1,83E-05 1,16E-07 1,181E-11 thee 3,54E-04 1,83E-05 3,98E-11 4,79E-08 1,80E-07 1,81E-12 thee 1,38E-03 3,12E-05 2,54E-07 2,090E-07 1,89E-07 1,89E-07 1,89E-07 1,89E-07 1,89E-07<	Benzo(a)pyrene	1 705 02	1.83E-02	Q	QN	S	QN.	ND
(a,l)anthracene 1. VGE-02 1.83E-02 ND ND ND ND gh,i)perylene 1. 70E-02 1.83E-02 ND ND ND ND Partiality identified Compounds (TICs) 1.83E-02 ND ND ND ND Red Hable 1.04E-02 1.28E-03 3.17E-09 3.82E-06 1.439E-06 1.483E-10 Inthine 7.62E-04 2.75E-05 2.51E-10 3.02E-07 1.139E-07 1.75IE-12 Inthene 3.54E-04 3.30E-05 1.11E-10 1.33E-07 1.46E-07 1.81E-12 Intene 8.13E-04 7.89E-05 2.53E-10 3.04E-07 1.146E-07 1.81E-12 Intene 1.38E-03 3.12E-05 4.61E-10 5.54E-07 2.090E-07 1.80E-07 Intene 1.38E-03 3.12E-05 2.34E-07 4.61E-07 4.800E-07 4.94E-11 Intene 1.38E-03 3.12E-05 2.34E-07 4.61E-07 4.800E-07 4.94E-11 Intene 1.38E-03 2.34E-	Indeno(1,2,3-cd)nyrana	705-07	1.83E-02	QN	Q.		ON.	Q
gh.i)perylene 1.70E-02 1.83E-02 ND ND ND ND Fantatively identified Compounds (TICs) 1.70E-02 1.83E-02 ND ND ND ND Fantatively identified Compounds (TICs) 1.04E-02 1.88E-03 3.77E-09 3.82E-06 1.439E-06 1.483E-0 Inthene 7.62E-04 2.75E-05 2.51E-10 3.02E-07 1.139E-07 1.77E-12 Inthene 3.54E-04 3.30E-05 1.11E-10 1.33E-05 1.75E-05 2.53E-10 3.04E-07 1.146E-07 1.181E-11 ene 1.17E-04 1.83E-05 3.36E-11 4.79E-08 1.806E-07 1.861E-12 thene 1.38E-03 3.12E-05 4.61E-10 2.54E-07 2.090E-07 2.154E-11 shelped 1.38E-04 1.83E-05 2.34E-07 4.800E-07 4.947E-11 shelped 3.28E-05 1.27E-06 4.800E-07 4.947E-11	Dibenz(a h)anthracena	1./UE-02	1.83E-02	Q.	CN	S S	Q	Q
Partition of compounds (TICs) 1.70E-02 1.83E-02 ND ND ND ND Fentatively identified Compounds (TICs) Tentatively identified Compounds (TICs) ND ND ND ND Partition of Inthene 1.04E-02 1.28E-03 3.17E-09 3.82E-06 1.439E-06 1.483E-10 Inthene 7.62E-04 2.75E-05 2.51E-10 3.02E-07 1.139E-07 1.174E-11 enh 3.54E-04 3.30E-05 1.11E-10 1.33E-05 1.146E-07 1.181E-12 ene 1.17E-04 1.83E-05 2.53E-10 3.04E-07 1.146E-07 1.181E-11 thene 1.38E-03 3.12E-05 4.61E-10 5.54E-07 2.090E-07 2.154E-11 hanthracene 6.88E-04 1.83E-05 2.34E-10 2.61E-07 4.800E-07 4.947E-11	Benzola h ingrylene	1./0E-02	1.83E-02	2	CN	Q.	QN	S
Paths ND ND Intherence 1.04E-02 1.28E-03 3.17E-09 3.82E-06 1.439E-06 1.483E-07 Intherence NB NB NB NB NB NB energia 1.17E-04 1.83E-05 2.53E-10 3.04E-07 1.146E-07 1.181E-11 thene 1.38E-03 3.12E-05 4.61E-10 5.54E-07 2.090E-07 1.861E-12 Alteros 1.38E-05 2.34E-05 2.64E-07 2.090E-07 1.861E-12 Alteros 1.38E-05 2.34E-05 2.34E-07 4.800E-07 4.947E-11 Alterose 1.83E-05 2.34E-10 2.81E-07 4.800E-07 4.947E-11	SVOC Tentativolis Ido 1881 - 1	1.70E-02	1.83E-02	S	CN	QN S	QN	QN
alene 1.04E-02 1.28E-03 3.17E-09 3.82E-06 1.439E-06 1.483E-10 hthylene 7.62E-04 2.75E-05 2.51E-10 3.02E-07 1.139E-07 1.74E-11 inthene 1.10E-04 1.83E-05 3.75E-11 4.51E-08 1.699E-08 1.751E-12 e 3.54E-04 3.30E-05 1.11E-10 1.33E-07 1.751E-12 1.751E-12 ene 1.77E-04 7.89E-05 2.53E-10 3.04E-07 1.146E-07 1.181E-11 thene 1.37E-04 1.83E-05 3.98E-11 4.79E-08 1.806E-07 1.861E-12 shele-03 3.12E-05 4.61E-10 5.54E-07 2.090E-07 2.154E-11 shele-03 3.12E-05 1.06E-09 1.27E-06 4.800E-07 4.947E-11	TO-13 (PAHe)	pounds (TICs)				CINI	QN	QN
htthylene 1.04E-02 1.28E-03 3.17E-09 3.82E-06 1.439E-06 1.483E-10 htthylene 7.62E-04 2.75E-05 2.51E-10 3.02E-07 1.139E-07 1.174E-11 e 3.54E-04 1.83E-05 3.75E-11 4.51E-08 1.699E-08 1.751E-12 threne 8.13E-04 7.89E-05 1.11E-10 3.04E-07 1.146E-07 1.181E-11 thene 1.17E-04 1.83E-05 3.98E-11 4.79E-08 1.806E-08 1.861E-12 thene 1.38E-03 3.12E-05 4.61E-10 5.54E-07 2.090E-07 2.154E-11 shall-cone 6.88E-04 1.83E-05 2.34E-10 4.800E-07 4.947E-11	Naphthalene				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Hithene 1,02E-04 2,75E-05 2,51E-10 3,02E-07 1,439E-05 1,439E-05 1,74E-11 ethere 1,10E-04 1,83E-05 3,75E-11 4,51E-08 1,699E-08 1,77E-12 threne 8,13E-04 7,89E-05 1,11E-10 1,33E-07 5,025E-08 5,178E-12 ene 1,17E-04 1,83E-05 3,98E-11 4,79E-08 1,806E-07 1,81E-11 thene 1,38E-03 3,12E-05 4,61E-10 5,54E-07 2,090E-07 1,861E-12 shathracene 6,88E-04 1,83E-05 2,34E-10 2,81E-07 4,800E-07 4,947E-11	Acenaphthylene	1.04E-02	1.28E-03	3.17E-09	3 82F-06	3000		
include 1,10E-04 1,83E-05 3,75E-11 4,51E-09 1,139E-07 1,174E-11 threne 3,54E-04 3,30E-05 1,11E-10 1,33E-07 5,025E-08 1,751E-12 ene 1,17E-04 7,89E-05 2,53E-10 3,04E-07 1,146E-07 1,181E-11 thene 1,38E-03 3,12E-05 4,61E-10 5,54E-07 2,090E-07 1,861E-12 3,14E-03 3,12E-05 1,06E-09 1,27E-06 4,800E-07 4,947E-11 hanthracene 6,88E-04 1,83E-05 2,34E-10 2,81E-07 1,061E-07 4,947E-11	Acenaphthone	7.62E-04	2.75E-05	╀	3 02E 07	1.439E-06	1.483E-10	7.195E-07
3.54E-04 3.30E-05 1.11E-10 1.31E-06 1.699E-08 1.751E-12 threne 8.13E-04 7.89E-05 2.53E-10 3.04E-07 1.146E-07 1.181E-11 thene 1.37E-04 1.83E-05 3.98E-11 4.79E-08 1.806E-07 1.861E-12 thene 1.38E-03 3.12E-05 4.61E-10 5.54E-07 2.090E-07 2.154E-11 shithracene 6.88E-04 1.83E-05 2.34E-10 2.81E-07 4.800E-07 4.947E-11	Fliorence	1.10E-04	1.83E-05	╀	4 E4E 00	1.139E-07	├	5.695F-08
intense 8.13E-04 7.89E-05 2.53E-10 3.04E-07 5.025E-08 5.178E-12 ene 1.17E-04 1.83E-05 3.98E-11 4.79E-08 1.806E-07 1.181E-11 thene 1.38E-03 3.12E-05 4.61E-10 5.54E-07 2.090E-08 1.861E-12 Janthracene 6.88E-04 1.83E-05 2.34E-10 2.81E-07 4.800E-07 4.947E-11	Dhonaid	3.54E-04	3.30E-05	+	1.015-00	1.699E-08	╀	8 497E-00
thene 1.17E-04 1.83E-05 3.98E-11 4.79E-07 1.146E-07 1.181E-11 1.38E-03 3.12E-05 4.61E-10 5.54E-07 2.090E-07 1.861E-12 3.14E-03 3.12E-05 1.06E-09 1.27E-06 4.800E-07 2.090E-07 2.154E-11 1.83E-04 1.83E-05 2.34E-10 2.81E-07 1.061E-07 1.061E	/ ricilarumene	8.13E-04	T	+	1.33E-07	5.025E-08	\dagger	2 512E-08
thene 1.38E-03 3.12E-05 4.61E-10 5.54E-07 2.090E-07 1.861E-12 3.14E-03 3.12E-05 1.06E-09 1.27E-06 4.800E-07 2.154E-11 Janthracene 6.88E-04 1.83E-05 2.34E-10 2.81E-07 1.061E-07 4.907E-11	Zigiracene	1.17E-04	T	+	2.04E-U/	1.146E-07	t	5 734 5 00
Janthracene 3.14E-03 3.12E-05 4.61E-10 5.54E-07 2.090E-07 2.154E-11 1)anthracene 6.88E-04 1.83E-05 2.34E-10 2.81E-07 4.900E-07 4.947E-11	Filloranthene	1.38E-03	T	4	1.79E-08	1.806E-08	\dagger	00.101
6.88E-04 1.83E-05 2.34E-10 2.81E-07 1.061E-07 1.064E-11	Pyrene	3.14E-03	†	-	5.54E-07	2.090E-07	+	9.020E-09
1.03E-U3 2.34E-10 2.81E-07 1.061E-07 1.04E-11	Benzo(a)anthracene	6.88F-04	\dagger		.27E-06	4.800E-07	+	.045E-U/
			1	-	2.81E-07	1.061E-07	+	2.400E-07

B-8

Table B-1: Air Modeling Output Data for the Cartridge, 9MM Ball, M882 (M9)

		A TO THE STATE OF A					
	X 22010		sults'				
	Average	Dally	Average	Average			
	Measured	Measured	Adjusted	Adlusted	Cial Wass	Substance	Substance
Č	Actual	Background	Emission	Finission	o onosiance	Concentration	Émission
Compound	Concentration	Concentration	Factor (EF)	-	Delimer	(CONC)	Rate (ER,)
Č	(mg/m³)	(ma/m³)	(lh/item)	=	(grams/item)	(grams/m³)	(g/ilem)/sec
Chrysene	7 22E-04	1 R3E 05	CHIENTEN C	(ID/ID INEVV)			
Benzo(b)fluoranthene	7 65F-04	1 03E-03	2 46E-10	2 95E-07	1.114E-07	1 1485 44	
Benzo(k)fluoranthene	4 85F.04	1 035-03	2 60E-10	3 13E-07	1.179E-07	1 2455 44	5.568E-08
Benzo(e)pyrene	8 16E 04	1 83E-05	1.65E-10	1.98E-07	7.472E.08	1.213E-11	5.895E-08
Benzo(a)pyrene	0 10E-U4	1.83E-05	2.77E-10	3.34E-07	1 2585 07	7.699E-12	3.736E-08
Indeno(1.2.3.cd)pyreps	/ USE-04	1.83E-05	2.40E-10	2 89E-07	1.230E-0/	1.297E-11	6.291E-08
Dibenz(a h)anthrocon	9.01E-04	1.83E-05	3.06E-10	3 68 5 07	1.088E-U/	1.121E-11	5.441E-08
Benzo(a h incerted	9.26E-05	1.83E-05	3 15F-11	3 70E 00	1.389E-07	1.432E-11	6.946F-08
Derizo(g.n.)perylene	2.04E-03	1.83E-05	8 02E 40	3.79E-08	1.428E-08	1.471E-12	7 1305 00
DIOXINS and Furans		The second second	0.30E-10	8.34E-07	3.145E-07	3.241F-11	1 572E 07
23/8-1CDD	4.16E-09	4 805 00					1.37.35-07
12378-PECDD	3 65E.00	4.44F 00	Q	Q.	ON	122	
123478-HXCDD	4 09E-00	4.44E-US	Q	QN	QN		QN
123678-HXCDD	4 25E 00	5.28E-09	Q	S	CN	2	ND
123789-HXCDD	8.4.20E-09	5.66E-09	QN	S		Q.	QN
1234678-HPCDD	2 001 00	8.89E-09	Q	SN SN	CIV.	QN	S
OCDD	7.02E-09	5.24E-09	8.53E-16	1.03F.12	CM 1010 C	Q	2
2378-TCNE	7.41E-08	6.86E-08	4.93E-15	5 93E-12	3.6/UE-13	3.988E-17	1.935E-13
19378 DECDE	4.22E-09	4.44E-09	S	0.30E-12	Z.235E-12	2.303E-16	1.117E-12
22.428 PF.OFF	3.82E-09	4.70E-09		2	QN	P	L CN
433478 11X055	2.42E-09	2.78E-09		2	S	QN.	Q.
123470-FACUF	3.04E-09	4.00F-09		2	QN	CN	
1235/8-HXCDF	3.12E-09	4.29E-09		Q.	QN	QN	
123/09-HACUF	2.54E-09	3.66E-09		2	QN	QN	2 2
434610-HACUF	2.14E-09	2.90E-09	2 2		QN	QN	CN
1234780 LIDORY	1.89E-09	2.30E-09	ď	ON 100 6	QN	Ð	CN
CODE	5.82E-09	4.35E-09	2 4	o.00E-13	3.015E-13	3.107E-17	SORE 43
	4.48E-09	5.75E-09	2 2	2 5	QN	NO.	NO
Nie delice			2	2	QN	QN	
Milropenzene	3.27E-03	NA	1	7			3
z-Nitrotoluene	3,27E-03	VIV	2	Q	QN	, CN	
3-Nitrotoluene	3 27E-03	V.	QN	QN	QN	2 2	ON.
4-Nitrotoluene	3.27E-03	¥N.	QN	QN	QN	QV Q	Q
Nitroglycerine	3 27 E - 03	V-1	Q	QN	CN		2
1,3-Dinitrobenzene	3.27E.03	NA	ND	QN	CN	ON.	Ω
	20-11-00	Y.	Q N	S.	CN	ON.	Q.
)	:	

Table B-1: Air Modeling Output Data for the Cartridge, 9MM Ball, M882 (M9)

	T.A.	ATC Firing Test Results	119				
	Average	Daily	Average	Average	Total Mass	Substance	Circumstance
•	Measured	Measured	Adjusted	Adlusted	of Sinetance	Concontingual	Substance
	Actual	Background	Emission	Emission	Fmilled	Concentiation	Emission
Compound	Concentration	Concentration	Factor (EF)	Factor	(Crame(lem)	(CONC)	Kale (EK4)
	(mg/m³)	(mg/m³)	(lb/item)	(Ib(Ib NEW)		(Significant)	(g/ilem)/sec
2,6-Dinitrotoluene	3.27E-03	NA	QN	CN	QV		
2,4-Dinitrotoluene	3.27E-03	NA	S	S		ON.	QN ND
1,3,5-Trinitrobenzene	3.27E-03	AN	Ę	2 2	ON C	QN	ND
2,4,6-Trinitrotoluene	3 27F-03	VN.	2 2	2	ON	QN	2
RDX	20 11 20 0	٢.	2	QN	QN	QN	CN
1 0 0 c c c c c c c c c c c c c c c c c	3.27E-U3	NA	QN.	2	QN	CZ	C S
4-Amino-Z,6-Uinitrotoluene	3.27E-03	ΑN	S	CZ	0.2	2	2
2-Amino-4,6-Dinitrototuene	3 27E_03	VIV		2	ON C	Q	2
Tetrv	3 275 09	V.1	2	2	QN	Q	2
HMX	3.27E-03	NA	Q	QN	ND	QN ON	CN
Design	0.55=-03	NA	Q	2	QN	CN	C N
rentaerythritoitetranitrate	6.55E-03	××	Q	Ç	2		2
Dibutyl phthalate	1.64E-01	NA	S		2	Q.	QN
Dioctyl phthalate	1 RAE_01	VIV	2 5	QN.	NO	Q	S
Dinhenvlamine	10 401 0	2	Q.	N N	O.X	Q	S
	0, 10E-UZ	NA	QN	2	QN	CN	S
Loonnotes:							2

ATC = Aberdeen Test Center (for additional information on the data, refer to the Firing Point Emission Study)

NA = Not Applicable ND = Not Detected

B-10

APPENDIX C

HEALTH-BASED SCREENING LEVELS AND ACUTE TOXICITY VALUES

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

Permanent Gases		() (0) He ()	Yalle No. 7			€.	ERPO		AEGL	Source	χ±χ
		DISKNEY SANTONIO	WANTED CANE	E STATE OF THE STA	N CHO NO NO			((10/m/))	(, w/bn)	(T or E	(Light)
Ammonia (NH ₃)	7664-41-7	1.04E+02	nc DC	104.39	0.0	1 04E103					
Carbon Dioxide (CO ₂)	124-38-9	NA		NA	2	1,046+02	1		¥	ш	1.75E+04
Carbon Monoxide (CO)	630.08-0	1.00E+04	Ju Su	NA		AN 100 t	NA		MA	-	5.40E+07
Oxides of Nitrogen (as NO)	10102-43-9	1.00E+02	nc	NA		1.00E +U4	2.3		NA	ш	2.30E+05
Sulfur Dloxide (SO ₂)	7446-09-5	8.00E+01	ne ne	(A		1.00E+02	NA		NA	Ŀ	3.08E+04
Acid Gases			2	5/1		8.00E+01	7.89E+02	7.86E+02	NA	ш	7.89E+02
Hydrogen fluoride	7664-39-3	AN		VIV.				š			
Hydrogen chloride	7647-01-0	2.08E+01	Ju	2 085104		NA	1.60E+03		NA	Ш	1.60F+03
Hydrogen bromide	10035-10-6	NA	2	4.00E+01	2	2.08E+01	4.50E+03	4.47E+03		ш	4 50F+03
Nitric Acid	7697-37-2	AM		AN V	***************************************	NA	¥	9.93E+03		-	9 935+03
Phosphoric acid	7664-38-2	1.04F+01	000	1 06F 104		ΝA	A A	2.58E+03	1.3		1.30E+03
Sulfuric Acid	7664-93-9	VIV	2	1.000.1	20	1.04E+01	AA		ĺ		3 OOE 103
Cyanide		CK	***************************************	NA		NA NA	2.00E+03			- 1	2.00E+03
Particulate Cyanide	57-12-5	NA		1001						***************************************	2001-100
Hydrogen Cyanide	74-90-8	3 13E±00	2	7.30E+01	nc	7.30E+01	ΑN	5.00E+03	NA	1	5 00E 103
Particulates		001-101	2	3.14E+00	20	3.13E+00	NA	5.17E+03	NA	- -	5.17F+03
Total Suspended Particulate	12789-66-1	5,00E+01	ou	VIV		1					20.1
		5.00F+01	2 0	\$ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		5,00E+01	YA N	NA	NA		AA
designation of the state of the		1 505.404	2 2	X .		5.00E+01	¥	NA	¥.		NA
		0.1000	2	AN		1.50E+01	NA	NA	AN		NA
Aluminum	7429.90.5	E 11E 100									CA
Antimony	7440-36-0	NA NA	JUC	3.65E+00	2	5.11E+00	NA	3.00E+04	NA	Ŀ	3 00 5 4 0 4
Seminary of the seminary of th	7440-38-2	4 47E-04		1.40E+00	20	1.46E+00	NA	1.50E+03	NA NA		1 505 104
	7440-39-3	5.21F-01	٤	4, 10E-04	0	4.47E-04		3.00E+01	NA N	- 1-	3 00F+04
Beryllium	7440-41-7	8.00F-04	2 (7 45 04	20	5.21E-01		1.50E+03	AN		1 50F+03
Cadmium	7440-43-9	1.07E-03	٥	0.435-04	0	8.00E-04	NA	5.00E+00	NA		5.00F+00
Calcium	7440-70-2	NA		NA NA	0	1.0/E-03	NA	3,00E+01	NA	F	3.00F+01
Chromlum	7440-47-3			100 TC3 F	0	NA.	A A	3.00E+04	AN	L	3 00E+04
	7440-48-4	AN		1,335-04	0	1.53E-04	Ϋ́	1.50E+03	NAN.		4 50E+03
	7440-50-8	· VIV		4.20C+02	20	Z.20E+02	¥	6.00E+01	AN		00.100
	7439-92-1	1 505+00		1.46E+02	nc	1.46E+02	NA	3,00E+03	NA	- -	3 00 5 1 0 2
Magnesium	7439-95-4	NA NA	2	₩.		1.50E+00	AA	1.50E+02	NAN	- -	1 50E+03
Manganese	7439-96-5	5.11E.02		NA POPTO		ΔN		3.00E+04	NA	-	3 00E + 02
	7440-02-0	N AN	1	7.22E-02	2 2	5.11E-02	1	3.00E+03	AM	-	3.00F+03
Selenium	7782-49-2	NA		1 835.101	2	7.30E+01	7	3.00E+03	ΑM	İ.	3.00F+03
				1.005.101	20	1.83E+01	A A	6.00E+02	AN	1	6 OOF 4 OO

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

3.11E+04	_	T									
1.45E+05	Ш	1	3.11F+0d	+-	7.30E+02	20	1.30E+0Z	1			
2.37E+06	⊢.li	1	1 45F±05	le	L		NA NA	J.	7.30E+02	75-15-0 7	
9.58E+06	H	1	2.30E+06	T	3.65E+02	n S	3.65E+02	20	NA	+	Carbon Disultida
7,92E+04	⊢		0.925.04	NA	3.13E+04		3.14E+04	†	3.15E+04	+	
2.30F+02	ш		2.29E+02	30E+02	5.21F+02		5.11E+02	1	0.21E+02	十	13
1 ROF + 06	1		1.80E+06	NA	5	22	2.08E-02		2.09E-02	十	roethene
2.81E+08	-		2.81E+06	YN SI	NA	Γ	Ŋ	1	NA OOF OO	十	
1 48 = +07	_		1.48E+07	¥ S	7 30 5 + 02	T	7.30E+02	nc	7.30E+02	十	
2 64E+0g	-		2.64E+06	7	20E403	22	1.83E+02		Z.U9E+02	十	fluoromethane
5.825+04	-		5.82E+04	Y S	2 32F±00	T	NA	ဥ	2.32E+00	十	
2.20F+04	ш		4,415+04	NA TOWN			5.11E+00	nc	0.415.00	+-	
1.28E+04	 - -		1.20=+04	2007	3.74F-03		3.48E-03	O	5 24 5 1 00	74-83-0	9)
2.06E+05	 - -		4.00E+05	T	2.20F-02	O	2.10E-02	0	3 74E 00	+-	
2.10E+07	_		z.10E+U/	T	1.07F+00	ပ	1.79E+00	٥	00 100	\dagger	VIII.yi Chloride
4,41E+06	<u> -</u>		4.41E+06	£ 2	NA		NA		1 0751.00	+-	Chloromethane
1.48F+07	Ŀ		1.48E+07	¥ 5	5.11 = +0.4	nc	5.11E+04	nc	0.11E+04	+	Freon 114
SN.		NA	¥	Y.	S COETO	20	1.83E+02	ည	2.09E+02	75.15	Chlorodifluoromethane
¥							NA		NA AN	113-07-1	Dichlorodifluoromethana
W.		NAN	NA A	¥.	NA						Propene
AN S		N	NA	A	V¥:		N A		NA	5779-94-2	
NA		¥ S	ΔN	NA NA	NA		NA V		NA	66-25-1	
NA AN	1	5 2	NA	ΑN	NA		¥ .	***************************************	¥N	1334-78-7	Hexaldahida
1.50E+04	1	¥ ×	NA	¥	MA		X S		N A	110-62-3	O.m.n.Tolirafdahida
7.38E+04	-	YY.	1 505.04	ΝĀΝ	3.65E+02	nc	3.65E+02	2	NA	590-86-3	Valorald
5.72E+03	Ш	Y S		NAN AN	AN		NA	9	3.65E+02	100-52-7	Sovalaradalista
7.50E+04		≨ :		5 72F+03	3.54E-03	ပ	3.30E-03	٥	NA	123-72-8	Bonzoldelinde
2.30E+02	Ш	¥ ÷	<u>. </u>	} -	NA		NA	6	3.54E-03	4170-30-3	Butwaldobuda
2.37E+06				2,3	2.09E-02	ည	2.08E-02	2	NA	123-38-6	Crotonaldebid
1.80E+04	쁴	1			3.65E+02	ဥ	3.65E+02	2 6	2.09F-02	107-02-8	Propries
1.23E+03	Ш	1		+-	8.73E-01	ပ	8.13E-01	ပ	3 65 - 400	67-64-1	Acetone
		_	4 00 - 00	1 235+03	1.48E-01	ပ	1.39E-01	0	8 73E 04	75-07-0	Acetaldenyde
3.00E+04	<u> </u>	¥N N	3.00E+04	$oldsymbol{\perp}$				***************************************	1 485 04	50-00-0	Formaldehyde
1.50F+02	Ţ	\downarrow	1.50=+02		1.10F+03		1.10E+03				10-11 Carbonyls
3.00E+02	<u> </u>	¥	3.00E+02		2.56E+01	nc	2.56E+01			7440-66-6	21117
3.00E+02		\downarrow	3.00E+02		2.56F-0		2.56E-01		$oxed{L}$	7440-62-2	venadium
E) (µg/m³)		<u> </u>	1	4_	1.83E+01	nc	1.83E+01		X X	7440-28-0	i nallium
	, -4	9		in a	(Hg/H)	(c of no		S REAL PROPERTY.		7740-22-4	Silver
	***			ERPG	<i>.</i>	Endboint	-7	- 42	=		
		40 Sept. 12.	MANAGEMENT OF			Toxidity	Z		599	*SVO	Compound
							2	-	Re		

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

CBmpolina	cas	Regione PRG	Toxibity, Endpoint	Regionia RBC	Toxisity Endpoint	HBSI	ERPG	相關	AEGL	Source	A
Acetonitrile	75-05-8	6.20E+01	20	6.21E+01	nc	6 20E±01	NAME	4 04 11 10 1	N. Call	(<u>1</u> 0 1)	STANDAY.
3-Chloropropene	107-05-1	1.04E+00	nc	NA		1.04E+00	9.39E+03	9.39F+03		_ u	1.01E+05
Metnylene Chloride	75-09-2	4.09E+00	ပ	3.79E+00	ပ	4.09E+00	000969			J L	8.39E+03
rerubutyi Alconoi	75-65-0	AA		NA		NA	¥			1	4 55E+05
Property of State of the state	107-13-1	2.83E-02	O	2.61E-02	ပ	2.83E-02	21700	2.17E+04		- u	2 17E+04
Mathyl t Butyl Ethor	156-60-5	7.30E+01	2	7.30E+01	nc	7.30E+01	ΝΑ	4.95E+04		1	4 95F+04
Hovers	1034-04-4	3,13E+03	2	3.13E+03	nc	3.13E+03	NA	4.32E+05		-	4 32F+05
1 4 Dichlarothan	110-54-3	2.09E+02	nc	2.08E+02	nc	2.09E+02	¥	5.28E+05		-	5 28E+05
1,1-Digital	75-34-3	5.21E+02	2	5,11E+02	nc	5.21E+02	¥	1.21E+06		- -	1 21E+06
viijyi Acetate	108-05-4	2.09E+02	nc	2.08E+02	nc	2.09E+02	19150	1.76E+04		- 1	1 92 = +04
2 Butanana	7-66-961	3.65E+01	nc	3.65E+01	nc	3.65E+01	ΑN	7.92E+05		L	7 92E+05
Ethyl Acatata	18-93-3	1.04E+03	ou u	1.04E+03	SC	1.04E+03	NA	8.85E+05		- -	8 85F+05
Mothy Appliate	0-0/-141	3.29=+03	DC	3.29E+03	nc	3.29E+03	NA	1.44E+06		-	1 44E+08
Chloroform	96-33-3	1.10E+02	nc	1.10E+02	nc	1.10E+02	¥N.	ΑN			NA NA
4 4 4 Tables of the	6-99-3	8.35E-02	O	7.73E-02	ပ	8.35E-02	ΝĀ	9.76E+03			9 765+03
Carbon Total of James	71-55-6	1,04E+03	nc	2.30E+03	nc	1.04E+03	1.94E+06	1.91E+06		- 11	1 045108
4.5 Dishlamatical	56-23-5	1.28E-01	0	1.18E-01	ပ	1.28E-01	1,28E+05	1.26E+05		1 12	1 285 106
1,z-Digilloroemane	107-06-2	7.39E-02	ပ	6.88E-02	ပ	7.39E-02	NA	8.08E+03		1	001207
Denzene	71-43-2	2.49E-01	O	2.16E-01	ပ	2.49E-01	1.56E+05	1.60E+05		- 4	4 FREE LOF
Isooctane (2,2,4-trimethylpentane)	540-84-1	ΑM		NA		AA	NA	3.50E+05		J F	2 EOE - OF
Trichlorodhana	142-82-5	NA		NA		NA	Ϋ́Α	1.80E+06		- -	1 80E+05
Ethyl Acrylate	71-55-6 4 40 66 F	1,04E+03	uc	2.30E+03	DC	1.04E+03	1.94E+06	1.91E+06		Ш	1 94F+06
1 2-Dichloropropage	76.67	1.40E-01	0	ΑN		1.40E-01	NA	6.14E+04		L	6 14F+04
Methyl Methacrylate	0-70-07	9.89E-02	0	9.21E-02	0	9.89E-02		5.08E+05		Ţ	5.08F+05
Dibromomethane	74.05.3	7,30E+0Z	20	7.30E+02	22	7.30E+02		4.09E+05		H	4.09E+05
1,4-Dioxane	123.01.1	8 115 01	2 0	3,050=+01	nc	3.65E+01	¥	2.50E+05		ļ-	2.50E+05
Bromodichloromethane	75.27.4	4 085 04	اد	0-080.0	0	6.11E-01	NA	9.00E+04		}	9.00E+04
4-Methyl-2-Pentanone	108-10-4	8 34E ±04	و اد	1.01E-01	0	1.08E-01	Α	4.00E+03		<u>-</u>	4.00E+03
Toluene	108.88.3	4 025402	IIC	7.30E+01	20	8.34E+01	¥	3.07E+05		<u>_</u>	3.07E+05
Octane	111.65.0	4.UZETUZ	20	4.10E+02	nc	4.02E+02	1.88E+05	1.89E+05		Ш	1.88E+05
trans-1.3-Dichloropropaga	40084 02 B	147 DO	***************************************	NA P		ΑN	Y Y	NA			NA
Ethyl Methacrylate	07 63 7	3001100	ပ	4.82E-02	၁	5.17E-02	NA	NA			NAN
1.1.2-Trichloroethane	70.00 6	3.29E+02	DC .	3.29E+02	nc	3.29E+02	¥	NA			NA
Tetrachloroethone	407 40 4	1.205-01	O	1.12E-01	0	1.20E-01	NA	1.64E+05		Ţ	1.64F±05
2-Hexanone	121-10-4 501 79 G	3,315,400	O	3.13E+00	0	3.31E+00	NA	6.78E+05		1	6.78E+05
Dibromochloromathana	424 40 4	AN 00 1		5.11E+00	20	5.11E+00	NA	4.09E+04		F	4.09F+04
DINION OF THE WIND	1-04-421	8,00E-02	0	7.45E-02	0	8.00E-02	NA	6.00E+03		F	6.00E+03

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

27-36) (IIg/m)	1.54E+05	1.38E+05	5,15E+04	5,43E+05	S E TE TOE	0.015.403	6.51E+05	2.13E+05	6.20E+03	2.46E+05	2.06E+04	6.03E+04	4.82E+04	1.25E+05	3.68F+05	AN	1.80E+05	3.61F+04	6.61E+05	5.20F+03	3 01 = +05	2 90E+04	3.716+04	3.21E+04			3.30E+06	4.60E+05	NA	VIV	VIV	3 78E-108	2.79F+06	9.52F+05	6.87E+06	2.20E+04
	*((! Or.E)	-	F	<u> </u>	F	F	-	F	ш	Н	H	F	H	Ŀ	F	F		L	Ŀ	F	Ш	-	-	-	Ш			 -	H				Ţ	· -	L	L	Ш
AEGL		2																																			
	THE STATE OF	1,54E+05	1.38E+05	5.15E+04	5.43E+05	6.51E+05		5.51E+05	2.13E+05	6.20E+03	2,46E+05	2,06E+04	6.03E+04	4.82E+04	1.25E+05	3.68E+05	ΑM	1.80E+05	3.61E+04	6.61E+05	5.17E+03	3.01E+05	2.90E+04	3.71E+04	3.20E+04	***************************************		3.30E+06	4.60E+05	N A	ΑĀ	¥	3.78E+06	2.79E+06	.52E+05	6.87E+06	2.21E+04
EPPS	AL STATE	¥ :	¥.	¥.	¥ N	Ą	VIV	NA April or	_	¥ :	¥.	7	7	¥	1	1	AN	T	NA		င္ပ			-	3.21E+04		1		7	NA	NA	NA					2.20E+04 2
HEST	9 0	0.735-03	0.215+01	Z.60E-01	1.06E+03	7.30E+02	7 305 ±00	-+-		1,735,700	4.04E+02	3.31E-UZ	9.01E-U4	1.04=+01	NA NA	6.21E+00	2.56E+02	6.21E+00	3.29E+00	-+	-	2,09E+02	4.80E-01		8.73E-02 3			NA	AN .	ΑN	NA	NA A	NA A	Δ N	NA	¥ I	3.74E-03 2.
TONIOIN Englicitic	STATE OF THE STATE		2	3	2	nc	Ju	2 2	2 0	> 2	2 0	اد	3			20	UC	nc i	2	0	0	2	ပ		٥											1	٥
Region 3	8 24F-03	6 21E+01	2 445 04	4 OPE : 02	1.000.103	7.30E+03	7.30E+03	1.04F+03	1 61E+00	4 02F+02	3 13E-02	3 435 00	NA 102		24 = 100	0.2 15 100	2.30E+02	3 205 1.00	3.435.400	Z.80E-U1	3.00E-02	3.28E+01	4.47E-01	2.08E+02	0.03E-02		VIV	Z 2	222	Z.	Y.	¥N.	AN.	AN S	¥ × ×	18 TO 17 TO 17	-40E-03
Moxicity Endbolling (c.bl/no)	c	ü	2	> 2	2	2	nc	nc	C	†	T		2	2	00	T	Ī	2 2	T		Ť		\dagger	<u></u>	3											0	1
Reolon 9	8.73E-03	6.21E+01	2.60F-01	1 08F±03	20 . 300	7.30E+02	7.30E+02	1.06E+03	1.75E+00	4.02E+02	3.31E-02	9.61E-04	1.04E+01	NA	6.21F+00	2.56F+02	6.21F+00	3.29F+00	3 DRE-01	3 96E-01	2 09E+02	4 ROE 04	2 085 102	8 73E-02	20.700		NA	NA	NA	NA	C V V	ÇN VI		AN	NA	3.74E-03	NA
CAS/#	106-93-4	108-90-7	630-20-6	100-41-4	108-38-3	106-42-3	95-47-6	100-42-5	75-25-2	98-85-8	79-34-5	96-18-4	108-86-1	622-96-8	108-67-8	98-83-9	95-63-6	541-73-1	t	†.	十	67-72-1	120-82-1	87-68-3			74-82-8	74-85-1	74-86-2	74-84-0	115.07.1	74.08.6	74-00-7	75-28-5	106-98-9	╁	-
(Calificand)	1,2-Dibromoethane	Chlorobenzene	1,1,1,2-Tetrachloroethane	Ethylbenzene	m. 8. b. Vulono	iiap-Aylerie	o-Xylene	Styrene	Bromotorm	Cumene	1,1,2,2-Tetrachloroethane	1,2,3-Trichloropropane	Bromobenzene	4-Ethyltoluene	1,3,5-Trimethylbenzene	Alpha Methyl Styrene	,2,4-Trimethylbenzene	,3-Dichlorobenzene	,4-Dichlorobenzene	Benzyl Chloride	1,2-Dichlorobenzene	Hexachlorethane	1,2,4-Trichlorobenzene	Hexachlorobutadiene	Company of the Compan	Hydrocarbons	Methane	Ethylene	Acetylene	Elhane	Propylene	Propane	Propyne (methyl acetylene)	sobutane	1-Butene/Isobutylene (115-11-7)	1,3-Butadiene/butane	

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

このでは、このから、このない。 からしかがく しょうかん かんかいか											
The second secon	1	Région 9	Toxicity	Region	Toxibity		STORY WAS A	Website States	Make To the Make The Control of the	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
		2		RBC	Endroline	HBS	ERPG		AEGI	200	
1_Putuno	A 10 684		(C)Q _(I)(C)	. (Lig/m),	(6.8f. htt)		E WIND			9	<u> </u>
DILYING I	107-00-6	Ϋ́		VΝ		3	Warmer Const	PANSAME.	Cillian I	(T of E)	(, uu/grl)
uans-butene	25167-67-3			VIV		NA	¥.	A A			ΔN
Z-Butyne (crotonylene)	503-17-3	L		£ .		۷A	NA	1.72E+04	AN		4 70E 104
n-Pentane	109-66-0	ΔN		AN .		ΑN	NA	Ϋ́N		-	1.7ZETU4
n-l-lexane	110-54-3	2 405402	***************************************	NA		NA	ΑN	1.80E+06		1	NA Post
SVOCs	0.10	4. IUE TUZ	nc	2.08E+02	nc	2.10E+02	¥.	5.28E+05		- !-	1.80E+06
n-nltrosodimethylamine	62.75.0	1 375 04								-	5.285.+05
bis(2-chloroethyl)ether	7 7 7 7 7 7	1.0.1	ပ	1,23E-04	ပ	1,37E-04	ΔN	2 505.03			
phenol	111-44-4	5.82E-03	ပ	5.69E-03	O	5.82E-03	S S	E 96F . 04			2.50E+03
2.chlorophonol	7-96-901	2.19E+03	nc	2.19E+03	ŊĊ	2 405.402	514	3.03E +U4			5.85E+04
4.3 Di 1.	95-57-8	1.83E+01	ນຕ	1835+01	2 2	4 000 000	¥	3.85E+04		-	3.85E+04
1,3-Ulchlorobenzene	541-73-1	3,29E+00	nc	3 200 100	2	1.83=+01	¥	5.25E+03			5 25E+03
1,4-dichlorobenzene	106-46-7	3.06F-01		2.435.700	22	3,29E+00	Ϋ́	3,61E+04			3 64 11 104
1,2-dichlorobenzene	95-50-1	2.09E+02	2 2	2.85E-U1	ပ	3.06E-01	ΝA	6.61E+05		- -	8.64E.10F
Denzyl alcohol	100-51-6	1 10 = 103	2	3.28E+01	20	2.09E+02	¥	3.01E+05		- 1	0,015+00
bis(2-chloroisopropyl)ether	108-60-1	1 00 = 04	20	1.10E+03	nc	1.10E+03	¥	5.53F+04		- -	3.01=+05
2-methylphenol	100.00	1.925-01	၁	1.79E-01	ပ	1.92E-01	AN	6 00E±04	-	- :	5.53E+04
hexachloroethane	1-04-06	1.83=+02	2	1.83E+02	nc	1.83E+02	ΝΔ	10 VIV		-	6.99E+04
n-nitroso-di-n-nronvlamina	1-7/-/0	4.80E-01	ပ	4.47E-01	O	4.80F-01		WAL CO			NA
4-mothylphonol	021-64-7	9.61E-04	ပ	8,94E-04	C	0 645 04	Z	2.30E+04		H	2.90E+04
offich constant	106-44-5	1.83E+02	2L	1 83F+02	2 2	4 027 100	¥N.	2.00E+02		÷	2.00E+02
IIIII ODAIIZADG	98-95-3	2.09E+00	ne ne	2 10E+00	2 3	1.03E+UZ	¥	NA			AN
Isophorone	78-59-1	7.08E+00		6 FOE 100	2	Z.U9E+00	¥	1.51E+04		L	1 515.104
2-nitrophenol	88-75-5	AN		0.595	0	7.08E+00	NA	2.83E+04			2 835.04
2,4-dimethylphenol	105-67-9	7 305 +04	2	NA TOOL		NA	₩	ΥN		-	4,030,104
bls(2-chloroethoxy)methane	111-91-1	NA	IIC	ان	nc	7.30E+01	AM	NA			AN A
2,4-dichlorophenol	120-83-2	1 10E±01	000	NA		NA A	NA	ΨN			YN Y
1,2,4-trichlorobenzene	120-82-1	2 085,103	2	1.10E+01	20	1.10E+01	ΑN	3.00E+04		1	NA NA
naphthalene	91-20-3	3 135.400	2 2	2.08E+02	nc	2.08E+02	A A	3.71E+04		- -	3.00E+04
4-chloroaniline	108.47.9	20.100	2	3,29E+00	၁၀	3.13E+00	AA	7 RRE+04	-	- -	3.715.404
hexachlorobutadiene	87.68.3	10400	20	1,46E+01	nc	1.46E+01	A	3.005+04		- -	7.86E+04
4-chloro-3-methylphenni	200-70	0.02=-02	ပ	8.03E-02	၁	8.62E-02 3	3 21 5 + 04	2 200 - 20			3.00E+04
2-methylnaphthalana	7-00-60			NA		+-	NA AN	0.205.04		Ш	3.21E+04
hexachlorocyclonantadiana	9-70-16	¥		7.30E+01	Su	7.30E+04		Z.00E+04		H	2.00E+04
2 d & trichloroupon	77-47-4	7.30E-02	nc	7.30E-02		7 305 00	T	Z.UUE+04	-	-	2.00E+04
2 / E tricklosset	88-06-2	1.10E+02	20	1.10E+02	T	4 40E-02	T	2.23E+02		_	2.23E+02
2 objects	95-95-4	3.65E+02	nc	3.655+02	T	1, 10E+02		3.00E+04		F	3.00F+04
2 alternational	91-58-7	2.92E+02	nc	2 92F+02	T	3.00E+UZ	₹	3.00E+04		F	3.00E+04
Z-IIII QUIIIII G	88-74-4	2.09E-01	DC	2 ORF-01	1	2.94E+02	T	6.00E+02		-	6.00F+02
Acenaphthylene	208-96-8	NA		NA	2	Z.U8E-U1	¥	NA		Ī	NA
	7	***************************************	T	- W1	1	NA		2.00E+02		L	00000

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

5.3	Source	S(LonE)	T 1,50E+04		1.2	NA T	7.5	1	6.00E+02	ا اد	D.	T 4 605:04	40+30C+04	8.00E+03	\dagger	WN VIV	T 767.04	7 4 605-00	T 200E+03	T 8 005 103	T 4 60T 104	T 3.00E+04	7 4 50E+01	T 5 00E+0#	T 6.00E+03	T 2.00E+02	T 6.21E+03	1 005+04	T 1 50E+06	COT TOO.	AN	T 7.50F+03	NA	T 3.00E+04	T 3.00F-+04	
			6 00E.109	1 25F+03	NA	7.50F+03	AN	6 00E±02	3.00E+04	7.50E+04	NA	1.50E+04	9.00E+03	5.00E+02	NA	NA	7.50E+01	1.50E+03	2.00E+03	6.00E+03	1.50E+04	3.00E+01	1.50E+04	5.00E+05	6.00E+02	2.00E+02	6.21E+03	1.00E+04	1.50E+05	NA	NA	7.50E+03	NA	3.00E+04	3.00E+04	
	THOUSE ERPG		L		L	7.30E+00 NA	1.46E+01 NA	7.30E+00 NA	L	1.46E+02 NA	NA	2.92E+03 NA			00		4.18E-03 NA	-02	NA		3.65E+02 NA	1.46E+02 NA	1.10E+02 NA	_	_	2.17E+00 NA		_	_			2.17E-03 NA		03	NA NA	•
Regibno Toxibity		4		2.19E+02 nc	NA	7.30E+00 nc	1.46E+01 nc	.30E+00 nc		.46E+02 nc	NA	25	NA	3.65E-01 nc	Z8E+00 c	1	\downarrow	3.42E-02 C	1	1.10E+03 nc	_	1	1	1	8.59E 04	1	1	1		1	٥١٥	٥	5)	NA C		
9. Toxicity	9:13:11 1	nc	nc	nc		20	nc	nc n	UC	nc 1	2	2			2	1	\dagger	2	Ť	1	\dagger	\dagger	Ť	Ţ	o a	\dagger			\dagger	T	t	t				
Region PRG			2 3.65E+00	十	-	+	4. 6	05.7	4 48E+01	-	20,0	╀	-	1 375,100	1	4 4	5 80	NA	1 10E+03	3 65 100	1 46E+02	1 10E+03	7.30F±02	2.17F-02			4.80E-01				2111	2.17E-02	2.17E-03			The state of the s
CASW.		131-11-3	7-07-909	6-75-60	2-60-66	132.64.0	104-04-8	7-41-131	100-02-	7005,72,3	84-66-2	100-01-6	534-52-1	86-30-6	101-55-3	118-74-1	87-86-5	85-01-8	120-12-7	84-74-2	206-44-0	129-00-0	85-68-7	56-55-3	218-01-9	91-94-1	117-81-7	117-84-0	205-99-2	207-08-9	50-32-8	193-39-5	53-70-3	191-24-2		
Compound	dimethylphibate	2.6-dinitrotolitena	acenaphthene	3-ntroanline	2,4-dinitrophenol	dlbenzofuran	2,4-dinitrotoluene	4-nitrophenol	Fluorene	4-chlorophenyl-phenylether	diethylphthalate	4-nitroaniline	4,6-dinitro-2-methylphenol	n-nitrosodiphenylamine(1)	4-bromophenyl-phenylether	hexachlorobenzene	pentachlorophenol	phenanthrene	anthracene	di-n-butylphthalate	fluoranthene	pyrene	butylbenzylphthalate	benzo(a)anthracene	chrysene	3,3-dichlorobenzidine	us(z-emyinexyi)phthalate	di-n-octylphthalate	Denzo(b)fluoranthene	benzo(k)fluoranthene	penzo(a)pyrene	Indeno(1,2,3-cd)pyrene	dibenz(a,h)anthracene	penzo(g,h,i)perylene	10 49 (8411-1)	TILLY INTINGI

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

CORPORATION CONTROLL CONTRO	CONS.W. In Interior (CONTROL) CONTROL (CONTROL			
200-366-8	208-96-8 NA NA NA NA 83-32-9 2.19E+02 nc 2.19E+02 nc 1.46E+02 nc 86-73-7 1.46E+02 nc 1.10E+02 nc 1.10E+02 nc 120-12-7 1.10E+02 nc 1.10E+02 nc 1.10E+02 nc 120-03-0 1.10E+02 nc 1.10E+02 nc 1.10E+02 nc 129-00-0 1.10E+02 nc 1.10E+02 nc 1.10E+02 nc 129-00-0 1.10E+02 nc 1.10E+02 nc 1.10E+02 nc 206-39-2 2.17E-02 c 8.58E-03 c c 2.05-90-3 c 192-97-2 NA NA NA NA NA nA nA 192-97-2 NA NA NA NA NA nA nA 192-37-2 NA NA NA NA NA nA nA 191-24-2 NA N	ERPGI WHEEL		ATK
83-32-9 2.19E+02 no 2.19E+02 no 1.46E+02 no 1.446E+03 no no no 1.446E+03 no no no no no no no n	83-32-9 2.19E+02	Wampin San San San San San San San San San Sa		(l/g/m³)
B6-75-7 146E+02	86-73-7 1.46E+02 nc 1.16E+02 nc 86-01-8 NA NA NA NA 120-12-7 1.10E+03 nc 1.16E+02 nc 206-44-0 1.46E+02 nc 1.46E+02 nc 129-00-0 1.10E+02 nc 1.16E+02 nc 129-00-0 1.10E+02 c 8.58E-03 c 206-43-0 2.17E-02 c 8.58E-03 c 207-08-9 2.17E-02 c 8.58E-03 c 207-08-9 2.17E-02 c 8.58E-03 c 207-08-9 2.17E-02 c 8.58E-03 c 192-37-2 NA NA NA NA 193-39-5 2.17E-03 c 2.02E-03 c 191-24-2 NA NA NA NA 1 19408-74-3 1.48E-08 c 4.17E-08 c 2 2.02-3-8-4 NA NA NA NA	NA	_	2.00E+02
86-01-8 NA	85.01-6	NA 1	<u> </u>	1.25E+03
120-12-7 110E+03 nc	120-12-7 1.10E+03 nc 1.10E+03 nc 206-44-0 1.46E+02 nc 1.29-00-0 1.10E+02 nc 1.20E-03 c 2.20E-03 c 3.50E-04 c 3	Y.	_	7.50E+04
206-44-0 1.46E+02	206-44-0 1.46E+02	NA S	<u>-</u>	2.00E+03
129-00-0 1.10E+02	129-00-0 1.10E+02 nc 1.10E+02 nc 56-55-3 2.17E-02 c 8.58E-03 c 205-99-2 2.17E-02 c 8.58E-03 c 205-99-2 2.17E-02 c 8.58E-03 c 207-08-9 2.17E-02 c 8.58E-03 c 207-08-9 2.17E-02 c 8.58E-03 c 192-97-2 NA	NA.	; —	6.00E+03
56-55-3	56-55-3 2.17E-02 c 8.58E-03 c 205-99-2 2.17E-02 c 8.58E-03 c 207-08-9 2.17E-02 c 8.58E-03 c 207-08-9 2.17E-02 c 8.58E-03 c 192-97-2 NA NA NA 50-32-8 2.17E-02 c 8.58E-03 c 193-39-5 2.17E-02 c 8.58E-03 c 193-39-5 2.17E-02 c 8.58E-03 c 191-24-2 NA NA NA NA 103-39-5 2.17E-03 c 8.58E-03 c 19408-74-3 1.748E-08 c 4.17E-08 c 19408-74-3 1.48E-06 c 1.38E-06 c 19408-74-3 1.48E-06 c 1.38E-06 c 19408-74-3 NA NA NA 19408-74-3 NA NA NA 19408-74-4 NA NA NA	NA:	-	3.00E+01
197-19-9 2.17E-00 0 0.0E-02 218-01-9 2176-02 205-99-2 207-08-9 207-	NA	-	1.50E+04	
205-39-2 2.17E-02 C	205-99-2 2.17E-02 C 8.58E-03 C 207-08-9 2.17E-02 C 8.58E-03 C 192-97-2 NA NA S 191-24-2 NA NA S 19408-74-3 1.48E-06 C 1.38E-06 C 1.38E-07 D D D D D D D D D D D D D D D D D D D	NA	-	6.00E+02
192-37-2	207-08-9 2.17E-01 c 8.58E-02 c 192-97-2 NA 50-32-8 2.17E-03 c 2.02E-03 c 193-39-5 2.17E-03 c 8.58E-04 c 193-39-5 2.17E-03 c 8.58E-04 c 191-24-2 NA NA NA NA NA NA NA NA 19409-74-3 1.48E-06 c 1.38E-06	NA.	!	2.00E+02
192-97-2	192-97-2 NA STATE-03 C 2.02E-03 C 193-39-5 C 193-30-7 C 19408-72-3 C 19408-72	NA		NA
50-32-8 2.17E-03 C 2.07E-03 NA	50-32-8 2.17E-03 C 2.02E-03 C 193-39-5 2.17E-02 C 8.58E-03 C 53-70-3 2.17E-02 C 8.58E-03 C 191-24-2 NA	NA		NA
193-39-5 2-1716-02 C 2-1716-02 NA NA NA NA NA NA NA N	193-39-5 2.17E-02 C 8.58E-03 C 53-70-3 2.17E-02 C 8.58E-03 C 53-70-3 2.17E-02 C 8.58E-03 C 191-24-2 NA	AN NA	NA	NA
1746-01-6	191-24-2 NA	NA 7	ļ-	7.50F+03
191-24-2	191-24-2 NA	NA		ΝΙΔ
1746-01-6 4.48E-08 C 4.48E-08 NA 3.00E+04 T 1746-01-6 4.48E-08 C 4.48E-08 NA 3.50E+00 T 1746-01-6 A.48E-08 C 4.48E-08 NA 3.50E+00 T 1746-01-6 A.48E-08 C 4.48E-08 NA NA NA NA 18527-28-6 NA NA NA NA NA NA NA 1868-28-46-9 NA NA NA NA NA NA NA 1868-28-46-9 NA NA NA NA NA NA NA 1868-28-9 NA NA NA NA NA NA NA N	1746-01-6 4.48E-08 C 4.17E-08 C 4.0321-76-4 NA	ΑN		7 OCT 200 6
1746-01-6 4.48E-08 C 4.17E-08 C 4.48E-08 NA 3.50E+00 T 1746-01-6 4.48E-08 C 4.17E-08 C 4.48E-08 NA NA 18227-28-6 NA NA NA NA NA 1.50E+00 T 19408-74-3 1.48E-06 C 1.38E-06 C 1.48E-05 NA NA NA 19408-74-3 1.48E-06 C 1.38E-06 C 1.48E-05 NA NA 19608-74-3 1.48E-06 C 1.38E-06 C 1.48E-05 NA NA 19608-74-3 1.48E-06 C 1.38E-06 C 1.48E-05 NA NA 19608-74-3 1.48E-06 C 1.38E-06 C 1.48E-05 NA 19608-74-3 1.48E-06 NA NA NA NA NA 19608-74-3 1.48E-06 NA NA NA NA NA NA 19608-74-3 1.48E-06 NA NA NA NA NA NA NA N	1746-01-6 4.48E-08	ΑN		3.00E+04
17.20-1-9 4.40E-06 C 4.48E-08 NA 3.50E+00 T 19.22-2-28-6 NA	19408-74-9			10000
1922-1-70-4	19327-28-6	ΑN		3 605 100
19408-74-26-0	25227-263-0 NA	NA		2,50E+00
1910-3-03-7 NA	19408-74-3 148E-06	NA		Z.30E+00
xin 35822-46-9 NA	xin 35822-46-9 NA	NA L	-	1 EDE 104
3268-27-95 NA	3268-87-9 NA NA NA NA STATE NA NA STATE NA NA STATE NA NA STATE NA STATE NA NA NA NA STATE NA NA NA STATE NA NA NA STATE STATE NA NA NA STATE	NA		NA
51207-31-9 NA NA NA NA 1.50E+02 T 57177-31-9 NA NA NA NA NA T 57177-31-9 NA NA NA NA NA NA 57177-31-4 NA NA NA NA NA NA 70648-26-9 NA NA NA NA NA NA 72918-21-9 NA NA NA NA NA NA 80851-34-5 NA NA NA NA NA NA 8n 55673-89-7 NA NA NA NA NA 88-95-3 2.09E+00 nC 2.19E+00 nC 2.09E+00 NA NA 88-72-3 3.65E+01 NA NA NA NA NA NA	57207-31-9 NA NA NA NA NA STATE STAT	NA		NA
5717-41-6 NA NA NA NA NA NA T 57117-31-4 NA T	5717-41-6 NA	NA		1 50F±02
57117-31-4 NA NA NA NA NA NA NA NA NA T	57117-31-4 NA	NA		2005-000
70648-26-9 NA NA NA NA T 57117-44-9 NA NA NA 7.50E-02 T 60851-34-5 NA NA NA NA T 72918-21-9 NA NA NA NA NA 80851-34-5 NA NA NA NA NA 98 5567-39-4 NA NA NA NA NA 98 39001-02-0 NA NA NA NA NA 98-95-3 2.09E+00 nC 2.19E+00 nC 2.09E+00 NA 1.51E+04	70648-26-9 NA	NA		NIA NIA
10046-20-9 NA NA NA NA NA NA NA NA NA	1 10946-20-9 NA	NA		7 50 50
72918-21-9 NA NA NA NA NA T 60851-34-5 NA NA NA NA NA NA T 67562-39-4 NA NA NA NA NA NA T 55673-89-7 NA NA NA NA NA NA T 39001-02-0 NA NA NA NA NA T T 98-95-3 2.09E+00 nc 2.19E+00 nc 2.09E+00 NA 1.51E+04 T	52918-21-9 NA NA NA NA NA NA 60851-34-5 NA NA NA NA SECTO-2-0 NA NA SECTO-3-0-1 NA NA SECTO-3-0-1 NA	¥N		7 505,00
60851-34-5 NA T	60851-34-5 NA NA NA NA 60851-34-5 NA NA SEE 100 NA NA SEE 100 NC 88.72-2 2.65 = 10.0 NA SEE 100 NC	AN		2 505 100
67562-39-4 NA NA NA 1.50E+00 T 67562-39-4 NA NA NA NA NA 55673-89-7 NA NA NA NA NA 39001-02-0 NA NA NA NA T 98-95-3 2.09E+00 nc 2.19E+00 nc 2.09E+00 NA 1.51E+04	98-95-3 2.09E+00 nc 2.19E+00 nc 188-72-3 a 6FE-104	NA		4.30E.±00
67562-39-4 NA	67562-39-4 NA NA NA 55673-89-7 NA NA 39001-02-0 NA NA NA NA SP-95-3 2.09E+00 nc 2.19E+00 nc RR.72-3 3 6 6 5 104	NA		NA
55673-89-7 NA T T T T T T R T <td>98-95-3 2.09E+00 nc 2.19E+00 nc 88.72.3 3.6E=104</td> <td>VIV.</td> <td></td> <td>1.50E+00</td>	98-95-3 2.09E+00 nc 2.19E+00 nc 88.72.3 3.6E=104	VIV.		1.50E+00
NA NA NA NA NA 3.00E+02 T 2.09E+00 nc 2.19E+00 nc 2.09E+00 NA 1.51E+04	NA NA NA 2.09E+00 nc 2.19E+00 nc	2		NA
2.09E+00 nc 2.19E+00 nc 2.09E+00 NA 1.51E+04	2.09E+00 nc 2.19E+00 nc	¥N.		NA
2.09E+00 nc 2.19E+00 nc 2.09E+00 NA 1.51E+04	2.09E+00 nc 2.19E+00 nc	NA	<u>!</u> —	3.00E+02
3 65E+01 2.03E+00 NA 1.51E+04 T	2 RELIA			
		NA NA	-	1.51E+04

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

00-08-4 2 65E-104	3.65E+01 nc 2.65E+01 NA NA NA	C 4.47E-01 0 3.65E+01 NA 3.37E+04 T 3.3	3.65E-01 nc 3.65E-01 nc 3.65E-01 NA	3,65E+00 nc 3,65E+00 nc 3,65E+00 NA	7.30E+00 nc 7.30E+00 nc 7.30E+02	1 10E±00 NA	2.24E-01 C 2.00E-04 T 3.00E+04	121-82-4 6.11E-02 c 5 50E-01 C 2.24E-01 NA 2.50E+04	19406-51-0 NA NA O 0.11E-02 NA NA	35572-78-2 NA NA NA	3.65E+01 ng 3.65E+04 T 1.50E+04 T 1.50E	2691-41-0 1.83E+02 n.c 1.83E+01 NA NA	78-11-5 NA NA NA NA NA NA	NA NA 5.00E+01	.01 C 4.47E 04 TC 3.65E+02 NA 1.50E+04	9 13E+01 nc 0 13E+04 C 4.80E-01 NA 1.00E+04	10 3.10E+01 NC 9.13E+01 NA 3.00E+04	
3-Nitrotoluene	4-Nitrotoluene	Nitroglycerine	1,3-Unitrobenzene	2.0-Unitrototuene	2,4-UIIIII OIOIUENE	1,3,3-1 finitrobenzene	2,4,6-Trinitrotoluene	RDX	4-Amino-2,6-Dinitrotoluene	2-Amino-2,6-Dinitrotoluene	Tetryl	HMX	Pentaerythritoltetranltrate	Dibutyl Phthalate	Dioctyl Phthalate	Diphenylamine	Footnotes:	

PRG: Preliminary Remediation Goals

c = cancer

nc = non-cancer

RBC: Risk-Based Concentration
HBSL: Health-Based Screening Level
(E) ERPG: Emergency Response Planning Guidelines
(T) TEEL: Temporary Emergency Exposure Limits
(A) AEGL: Acute Exposure Guideline Level

ATV: Acute Toxicity Value

NA: Not Avallable

APPENDIX D RISK ASSESSMENT DATA

Values
th-Based
th Heal
ions Wi
oncentrat
of Air C
Comparison o
Table D-1: 0

			Cartridge	MMe,	Cartridge, 9MM Ball, M882			
			3	2	4000			
Compound	C _{chronto} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronlc} / HBSL	> 1?	Cacute (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
Permanent Gases								
Ammonia (NH3)	4.62E-02	1.04E+02	4 43E.04	5	1 04F .00			
Carbon Dioxide (CO2)	4.54E+00	N.	10-70-	2 2	4.245+00	1./5E+04	2.42E-04	n O
Carbon Monoxide (CO)	6.95E+00	1.00E+04	A OSE-OA	2 2	1.0/E+03	5.40E+07	3.08E-05	no
Oxldes of Nitrogen (as NO)	2.23E-01	1.00E+02	2 23E-03	2 2	9.37E+02	2.30E+05	2.77E-03	2
Sulfur Dioxide (SO2)	1.82E-03	8.00E+01	2 28E-05	2 2	1 875 04	3.08E+04	2.66E-03	9
Acld Gases			20	2	1.0/=-01	7.89E+02	2.11E-04	2
Hydrogen fluoride	ΑN	2		1	414			
Hydrogen chloride	Ϋ́	2 08F±01		B	¥N.	1.60E+03		па
Hydrogen bromide	AM	MN		Ē	NA NA	4.50E+03		na
Nitric Acid	6 49F-03			E	¥N.	9.93E+03		E
Phosphoric acid	NAM NAME OF THE PARTY OF THE PA	1047.04		g	5.95E-01	1.30E+03	4.58E-04	2
Sulfuric Acid	1 085-03	1.045.+0.1		na	ΝΑ	3.00E+03		Ba
Cvanide	20-102	ANI .		na	1.82E-01	2.00E+03	9.09E-05	2
Particulate Cyanide	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1						
Hydrogen Chanida	YAY C	7.30E+01		na	ΑN	5.00E+03		6
Darling Oyaling	4.12E-02	3.13E+00	1.32E-02	9	1.51E+01	5.17E+03	2 92E-03	<u> </u>
Total							20	2
l otal Suspended Particulate	4.78E-01	5.00E+01	9.56E-03	2	4 39E+01	VIV		
PM10	5.40E-01	5.00E+01	1.08F-02	2 2	4 OFE +04	¥2		na
PM2.5	4.60E-01	1.50F+01	3 07E 02	2 2	4.900.401	¥		na
Metals			2.01 - 02	2	4.22E+U1	¥		na
Aluminum	1.60E-03	5.11E+00	3 13E-04	2	E 07F 04	1000		
Antimony	4.62E-02	1.46E+00	3 16E-02	2 2	4 80E 104	3.00E+04	1.96E-05	2
Arsenic	6.61E-05	4 47F-04	1 485 04	2 2	1.090+01	1.50E+03	1.13E-02	2
Barium	3.98E-02	5 21E_04	7 645 00	2	3.60E-02	3.00E+01	1.89E-03	2
Beryllium	NA	8 OOE 04	/ .04E-UZ	2	1.46E+01	1.50E+03	9.74E-03	2
Cadmium	MA	0.00E-04		g	¥	5.00E+00		na
Calcium	1 305 03	1.07		ВП	¥ N	3.00E+01		na na
Chromium	NIA NIA) N N		na	5.10E-01	3.00E+04	1.70E-05	2
Cohalt		1.53E-04		na	ΑΝ	1.50E+03		2
Congr	AN	2.20E+02		na	Ϋ́	6.00E+01		2 2
loddoo	70-367.7	1.46E+02	1.54E-04	no	8.25E+00	3.00E+03	2 75F-03	2 2
			:		*		7, 7, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	2

11/29/00

			Cartridge DC	9MIN	Cartridge, 9MM Ball, M882 DODIC: A363			
Compound	Cehronic (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chrontc} / HBSL	> 12	Cacute (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
Lead	1.55E-01	1.50E+00	1.03E-01	2	5 GRE+01	4 605,00	70 101 0	
Magnesium	ΑN	N		2 2	NA NA	1.305+02	3.79E-01	2
Manganese	¥	5 11E-02		2	X 2	3.00E+04		na
Nickel	AN	7 30E+04		19	¥Z.	3.00E+03		na
Selenium	AN	1 83E+01		la	Y.	3.00E+03		na
Silver	AN	1 835+01		na i	¥.	6.00E+02		na
Thallium	AN	2 FRE 04		la I	¥	3.00E+02		na
Vanadium	NA	2 KRE101		œ !	¥.	3.00E+02		na
Zinc	3 73E-03	4 40E+01	2777	na	NA	1.50E+02		na
TO-11 Carbonyls	20 12	1,105,103	3.41E-U0	2	1.37E+00	3.00E+04	4.57E-05	2
Formaldehyde	E 00E 04	10 701 1						
Acetaldehyde	S.UGE-U4	1.48E-01	3.39E-03	2	1.07E-01	1.23E+03	8.71E-05	2
Acetone	V. V.	8.73E-U1		na	ΔA	1.80E+04		E
Acroloin	NA POLICE	3.65E+02		na	NA	2.37E+06		2
Dronionaldahuda	1.02E-U4	2.09E-02	8.71E-03	2	1.67E-02	2.30E+02	7.25E-05	2
Crotocaldobuda	¥.	N/		na	NA	7.50E+04		2 2
Bultishigh	¥	3.54E-03		na	NA	5.72E+03		8
Dutylaidellyde	¥	N N		na	NA	7.38E+04		2 2
benzaldenyde	Ψ¥	3.65E+02		na	AN	1.50E+04		<u> </u>
Isovaleraldenyde	ΨN	N<		na	ΑΝ	NA NA		0 0
Valeraidenyde	¥N.	≥		na	AN	¥		0 0
opini,p-10lualdenyde	¥.	À		na	Α¥	ĕN		9 9
2 5-Dimethylberraldskida	¥ S	2		na	ΝΑ	Ą		2 2
VOCs	X.	28		Вa	AN AN	NA		БП
Propene	2 72E-03	M		1				
Dichforodiflioromathana	E 20E 0e	VVI CO. TOO		па	2.49E-01	AA		na
Chlorodifluoromethane	0.49E-00	Z.09E+0Z	2.54E-08	2	1.94E-03	1.48E+07	1.31E-10	2
From 114	V.	5.11E+04		na	NA	4.41E+06		E
Chloromothana	YAI C	N		na	NA	2.10E+07		2
Visit Otheria	Z.92E-U/	1.07E+00	2.73E-07	00	2.50E-04	2.06E+05	121F-09	2
4.3 Butalism	NA 2012	2.20E-02		na	ΑN	1.28E+04		2 6
Promomoral Bromomera	Z.Z.IE-05	3.74E-03	5.92E-03	no	4.73E-03	2.20E+04	2.15E-07	2 2
Chlorothene	Y S	5.21E+00		B	NA	5.82E+04		2 2
Dichlorofluoromethan	XX X	2.32E+00		na	NA	2.64E+06		e
	MA	Z.09E+02		na	NA	1.48E+07		2

			Cartridge,	9MIN	ge, 9MM Ball, M882 DODIC: A363			
Compound	C _{chronle} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronle} / HBSL	> 12	Cacute (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
Trichlorofluoromethane	Ϋ́	7.30E+02		2	472	1700		
Pentane	2.16E-05	À		2 2	NA 1047	2.81E+06		na
Acrolein	2.03E-03	2 09E-02	0 725 00	19	7.91E-03	1.80E+06	4.40E-09	2
1,1-Dichloroethene	N A	5 24E±02	9.13E-02	2	1.86E-01	2.30E+02	8.09E-04	2
Freon 113	AN AN	3 135+04		la I	¥.	7.92E+04		na
Acetone	1.61E-02	3.65F±02	A 44E 0E	e i	NA 1	9.58E+06		ра
Methyl Iodide	NA AA	NIV	4.415-03	2	5.90E+00	2.37E+06	2.49E-06	2
Carbon Disulfide	3 58F-05	7 305 100	7 64 7 69	na	¥	1.45E+05		na
Acetonitrile	1.01E-03	A 20E 104	4.91E-08	2	1.31E-02	3.11E+04	4.23E-07	2
3-Chloropropene	AN	4 045 100	1.63E-U5	2	3.70E-01	1.01E+05	3.67E-06	2
Methylene Chloride	2.18E-03	4 NOF + NO	E 24F 04	멸	ΨN	9.39E+03		БГ
tert-Butyl Alcohol	ΔN	4.09L+00	3.34E-U4	2	4.67E-01	6.96E+05	6.71E-07	2
Acrylonitrile	2 11F-04	14V	7 105	g	ΑΝ	4.55E+05		na
trans-1,2-Dichloroethene	NA NA	7.035-02	7.48E-U3	2	4.52E-02	2.17E+04	2.08E-06	2
Methyl t-Butyl Ether	VV	7.305+01		na	Y Y	4.95E+04		na
Hexane	20 30 0	3.13E+03		na	NA	4.32E+05		6
1.1-Dichloroethane	0.02E-U3	2.09E+02	4.23E-05	인	3.24E+00	5,28E+05	6.13E-06	2
Vinyl Acetate	Ç <12	5.21E+02		na	A N	1.21E+06		2 2
cis-1.2-Dichloroethene	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	2.09E+02		na	NA NA	1.92E+04		2 6
2-Butanone	4 295-05	3.65E+01	,	na	ΝΑ	7.92E+05		E E
Ethyl Acetate	5 55E-05	1.04E+03	4.11E-08	2	1.57E-02	8.85E+05	1.78E-08	2
Methyl Acrylate	AN	4 40E+03	1.69E-08	2	2.04E-02	1.44E+06	1.41E-08	2
Chloroform	AN	8 25E 00		E	₹	NA		na
1,1,1-Trichloroethane	2.54F-06	1 04E±02	2 425 00	E .	¥Z	9.76E+03		na
Carbon Tetrachloride	AN	1 285-04	Z.43E-U9	2	2.33E-04	1.94E+06	1.20E-10	2
1,2-Dichloroethane	2.67E-05	7 305 02	2027	<u>e</u>	¥	1.28E+05		na
Benzene	1.85E-03	2 40E 04	3.0 IE-04	2	2.29E-02	8.08E+03	2.83E-06	2
Isooctane (2,2,4-trimethylpentane)	NA	A. TOE-UI	7.41E-03	2	3.95E-01	1.56E+05	2.53E-06	2
Heptane	1.59F-05			na L	ΨV	3.50E+05		ВП
Trichloroethane	AN	1 045102		na	5.84E-03	1.80E+06	3.24E-09	2
Ethyl Acrylate	AN	1 40E 04		gu	ΑΝ	1.94E+06		na
1,2-Dichloropropane	AM	0.405-01		e	ΑΝ	6.14E+04		па
Methyl Methacrylate	AN	7.30E±02		E	ΑN	5.08E+05		па
Dibromomethane	AN	2 AEE 104		e e	NA	4.09E+05		na
		0.00E+01		na	AA	2.50E+05		па
2 9MM Risk.xts		٦.4]

0
0
_
o
છ
•
~
₩

	> 12		na	2	2 2	9 6	2 2	2 2	0 0	2 2	2 2	2 2	2 2	2 2	0 0	2 2	2 2	2	2 2	2 2	<u> </u>	na	В	na	na	no	na	Па	2	na	na	na	na	па	na	
	Gacute/ ATV					3 33E-07	0.000										2.26E-08	5.65E-08	3,77E-08	1.98E-08						4.44E-08	•		3.86E-08							
	Acute Toxicity Value (µg/m³)		9.00E+04	4.00E+03	3.07E+05	1.88E+05	NA	NA	ΑN	1.64E+05	6.78E+05	4.09E+04	6.00E+03	1.54E+05	1.38E+05	5.15E+04	5.43E+05	6.51E+05	6.51E+05	2.13E+05	6.20E+03	2.46E+05	2.06E+04	6.03E+04	4.82E+04	1.25E+05	3.68E+05	NA POTION	1.80E+05	3.61E+04	6.61E+05	5.20E+03	3.01E+05	2.90E+04	3.71E+04	70711700
Cartridge, 9MM Ball, M882	Cacute (µg/m³)		NA	NA	NA	6.25E-02	NA	NA	NA	AA	ΑN	NA	ΑN	ΑN	NA A	¥	1.23E-02	3.68E-02	2.45E-02	4.23E-03	NA	NA	A'A	AN.	NA	3.35E-U3	£ 5	8 04E 03	0.946-03	¥ S	<u></u>	NA.	AA .	ΨN.	W.	NA
9MIV	> 12		g	na	na	ou	na	na	na	na	na	na	na	na	na	na	2	2	2	٤	2	ē	E :	<u>e</u>	<u> </u>	<u> </u>	2 2	2 2	2 2	2 2	<u> </u>	<u>a</u>	la i	<u> </u>	e s	_ _
Cartridge	C _{chrontc} / HBSL					1.70E-06											3.16E-08	1.37E-07	9.16E-08	4.35E-08								3 05E-08	2000							_
	Health-Based Screening Level (µg/m³)	8 44E 04	0.115-01	1.08E-01	8.34E+01	4.02E+02	N<	5.17E-02	3.29E+02	1.20E-01	3.31E+00	5.11E+00	8.00E-02	8.73E-03	6.21E+01	2.60E-01	1.06E+03	7.30E+02	7.30E+02	1.06E+03	1.75E+00	4.0ZE+0Z	3.31E-02	1 04E±01	N N	6.21E+00	2.56E+02	6.21E+00	3 29F+00	3.08F-01	3 96E-02	20 TOSE 02	4 ROE-04	2 DRE-402	8 73E-02	70.70
	Сенгопіс (µg/m³)	ΔN	C.V	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	NA C	6.82E-04	₹	AN	AA .	AN .	Y.	Y.	NA.	A'A	AN .	NA 1,00	3.34E-05	1.00E-04	6.69E-05	4.01E-UD	¥ S	Z V	AN	NA NA	1.51E-05	NA	AN	1.89E-05	NA A	WA	NA A	NA	NA	NA NA	NA NA	
	Compound	1,4-Dioxane	Bromodichloromethene	4-Mathyl-2-pentange	Tologo	alianio	trans 13 Dishlocare	Ethyl Mathaerica	1 1 2 Trichloroshan	Totrachlorosthora	2 Hoones	Dibromochloromothano	1 2. Olymonykan	Chloridenialie	1 1 1 2 Tetraphysothers	Ethylhose and Ethylpose	m&n.Xvlene	o-Xvlene	Sturana	Bromoform	Climene	1,1,2,2-Tetrachloroethane	1,2,3-Trichloropropane	Bromobenzene	4-Ethyltoluene	1,3,5-Trimethylbenzene	Alpha Methyl Styrene	1,2,4-Trimethylbenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Benzyl Chloride	1,2-Dichlorobenzene	Hexachlorethane	1,2,4-Trichlorobenzene	Hexachlorobutadiene	L

0
0
6
õ
⋍
Ξ
•

			Cartridge	9MIV	Cartridge, 9MM Ball, M882			
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level	Cchronic/	v 42	C. (Ind/m³)	Acute Toxicity	j	
		(hg/m³)	HBSL		acute (FB/11)	Value (µg/m³)	Cacute/ AIV	× 1~
Hydrocarbons								
Methane	2 245 00							
Ethylene	1 165 00	AV.		na	1.22E+01	3.30E+06	3 71E.08	5
Acetylene	1.135-02	SS.		na	4.23E+00	4 60F+05	00 200 0	2
Ethono	4.90E-03	N		na	4.49E-01	NA AN	9.ZUE-U0	2
CHIBITE	2.00E-03	N		2	1 84E-04	¥ .		Ba
Propylene	3.40E-03	N		2 8	3 12 01	AN :		na
Propane	3.93E-04	N		2 2	1 445 04	NA SPT-25		na
Propyne (metnyl acetylene)	4.75E-04	≥		2 2	1 74F 04	3.78=+06	3.81E-08	2
Isobutane	NA	N		5 2	10-46-01	2.79E+06	6.25E-08	2
1-Butene/Isobutylene (115-11-7)	1.15E-03	À.		<u> </u>	¥	9.52E+05		na
1,3-Butadiene/butane	¥	3 74E_03		E	4.20E-01	6.87E+06	6.12E-08	2
cls-butene	AN	0.74E-03		g	ΨN	2.20E+04		2
1-Butyne	AM	NA NA		ē	N A	1.72E+04		2
trans-Butene		AN.		na	ΝΑ	¥		2 2
2-Butyne (crotonylana)	XX SX	2		na	ΨN	1.72E+04		<u> </u>
n Donland	¥N.	2		na	Ą	N N		<u>a</u>
n-remane	ΝΑ	N<		na	NA	1 905		na
i-nexane	1.10E-02	2.10E+02	5.23E-05	2	4.03E+00	1.00E+00		na
SVOCS					2001	3.40E+U3	7.64E-06	2
n-nitrosodimethylamine	NA	1.37E-04		120	AN	20.101.0		
Dis(z-crijoroetnyi)etner	Ϋ́	5.82E-03		2	Y AV	Z.30E+03		na
phenol	ΨV	2.19E+03		2	NA NA	3 8 EE 104		na
1 3 Disherek	Y V	1.83E+01		2	AN	5.05E±09		na
1 4 1 - Friend Openzene	ΨV	3.29E+00		E	ΔN	0.200.00		na
1,4-dichioropenzene	NA NA	3.06E-01		2	VIV	3.015+04		na
I,z-dichlorobenzene	NA NA	2.09E+02		2 2		0.61E+05		na
penzyl alcohol	AA	1.10E+03		2 2		3.01E+05		na
Dis(2-chlorolsopropyl)ether	AA	1.92E-01		2 2	£ 5	5.53E+04		na
2-methylphenol	AN A	1.83E+02		<u> </u>	XX.	6.99E+04		g E
hexachloroethane	AA	4 ROF-01		B	¥.	NA		e
n-nitroso-di-n-propylamine	AA	0 815 04		g	Ϋ́	2.90E+04		g
4-methylphenol	AN	1 835100		na	AN AN	2.00E+02		na
nitrobenzene	NA	2 005-00		na L	ΑA	NA		2
isophorone	NA	7.095.00		па	NA	1.51E+04		g
		7.00E+00		na	Ϋ́	2.83E+04		

2
_
_
0
2
_
↽
~

r			_		,				_		_																												
		> 12			na	na	na	na	na	ou	na	na	na	na	na	па	na	2	2 0	2 2	<u> </u>	<u> </u>	<u> </u>	E E	<u>ء</u>	<u> </u>	<u> </u>	<u> </u>		<u> </u>	<u> </u>	<u> </u>	<u>a</u>	<u>a</u>	ē	na	na	na	Γ
		C _{acute} / ATV								7.11E-07											1	1			+			+					+						-
		Acute Toxicity Value (µg/m³)		ΔIN		C < 2	AN CO	3.00E+04	3.7 IE+04	7.00E+04	3.00E+04	3.21E+04	2.00E+04	4.00E+04	2.23E+02	3.00E+04	3.00E+04	6.00E+02	AA	2.00E+02	1.50E+04	6.00E+02	1.25E+03	AN	7.50E+03	¥	6.00E+02	3.00E+04	7.50E+04	W	1.50E+04	9.00E+03	5.00E+02	NA	VIV	7 505 104	1 505.403	2 000-103	Z.UUF+(13
Cartridge, 9MM Ball, M882	DODIC: A363	Cacute (µg/m³)		¥N	NA NA	AN	ΔM	AN	5.59F-02	NA	NA		S A	VIV	X	X .	Y.	¥	¥	NA NA	AA	AA	NA	Ϋ́	NA	ΑA	AN	ΝΑ	NA	NA	NA	NA	AN	ΑΝ	AN AN	AA	NA	NA	
9, 9MI	Solici	> 12		na	na	na	na	na	2	na	na	2	na	2	2 2	2 2	<u> </u>	<u> </u>	e e	E E	na	na	na	na	па	па	Ba	na	na	na	na	na L	na	na	na	na n	na	g	-
Cartridge	ă	C _{chrontc} / HBSL							4.87E-05																														
		Health-Based Screening Level (µg/m³)		AN.	7.30E+01	NV	1.10E+01	2.08E+02	3.13€+00	1.46E+01	8.62E-02	N/	7.30E+01	7.30E-02	1.10E+02	3.65E+02	2.92E+02	2.09F-01) N	2 REE 104	9.00E+04	3.00E+00	z.19E+UZ	NV POPT OF	7.30E+00	7 200-100	2 02E+00	4 AREAD	NN/	2 025.00	ANV	2 ARE 04	3.03E-UI	1.37 E+00	≥	4.18E-03	5.60E-02	N	
		C _{chronic} (µg/m³)	ΔN	VIV.	5	Y.	Š	¥N.	1.52E-04	AA	AA.	NA	NA.	¥	¥	¥	NA	NA AA	. AN	AN	NA	NA	AN	ΝΑ	Y AN	NA	AN	NA NA	NA AN	NA	NA NA	ΑΝ	NA	VIV	XX X	¥ ×	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	NA	
		Compound	2-nitrophenol	2,4-dimethylphenol	bis(2-chloroethoxy)methane	2.4-dichlorophenol	1.2.4-trichlorohenzona	analythalene	4-chloroaniline	hexachlorobitadions	4-chloro-3-methylphonol	2-methylneshtholes	hexachlorocyclopartedies	2 A & triablance	2.4.5-wichlorophenol	loualido ioniscis.	z-chioronaphthalene	z-nitroaniline	Acenaphthylene	dimethylphthalate	2,6-dinitrotoluene	acenaphthene	3-nitroaniline	2,4-dinitrophenol	dlbenzofuran	2,4-dinitrotoluene	4-nitrophenol	Fluorene	4-chlorophenyl-phenylether	diethylphthalate	4-nitroanlline	4,6-dinitro-2-methylphenol	n-nitrosodiphenylamine(1)	4-bromophenyl-phenylether	hexachlorobenzene	pentachlorophenol	phenanthrene		DAMA DILL

			Cartridge DC	DIC:	Cartridge, 9MM Ball, M882 DODIC: A363			
Compound	G _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chrontc} / HBSL	> 12	Cacute (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
anthracene	NA	1.10E+03		na	Ϋ́	6.00F+03		2
di-n-butyiphthalate	NA	3.65E+02		ВП	NA	1 50F±04		<u> </u>
fluoranthene	NA	1.46E+02		na	NA	3.00=+01		<u> </u>
pyrene	NA	1.10E+02		na	AN	1 50E ±04		e i
butylbenzylphthalate	ΝΑ	7.30E+02		па	Y.	5 00F+05		B
benzo(a)anthracene	NA	2.17E-02		na	NA	8.00E+03		e !
chrysene	ΝΑ	2.17E+00		g	AN A	2.00E+02		e l
3,3-dichlorobenzidine	NA	1.50E-02		na	ΑN	6.21E+03		E :
bis(2-ethylhexyl)phthalate	AN.	4.80E-01		па	¥	1.00F+04		<u> </u>
dl-n-octylphthalate	NA VA	7.30E+01		ББ	¥	1 50F+05		<u> </u>
benzo(b)fluoranthene	NA	2.17E-02		na	NA	MA		<u> </u>
benzo(k)fluoranthene	ΝΑ	2.17E-01		g	AN AN	V V		e e
benzo(a)pyrene	NA	2,17E-03		na	AN	7 505.102		<u> </u>
indeno(1,2,3-cd)pyrene	AN	2.17E-02		E	Ą	NA AN		e l
dibenz(a,h)anthracene	NA	2.17E-03		na	AZ Z	3 00E+04		<u> </u>
benzo(g,h,l)perylene	NA	N/		ā	ΝA	3.00E+04		200
								5
TO-13 (PAHs)								T
naphthalene	7.19E-05	3.13E+00	2.30E-05	2	2.64E-02	7 88E+04	2 2 2 5 5 7 7	T
acenaphthylene	5.69E-06	N/		na	2 09F-03	2 005 104	3.33E-07	2
Acenaphthene	8.49E-07	2.19E+02	3.88E-09	2	3.11E-04	1.05E±02	1.04E-05	2
fluorene	2.51E-06	1.46E+02	1.72E-08	2	9.21E-04	7.50F+04	1 23E-08	2 2
pnenanthrene	5.72E-06	N/		na	2.10E-03	2.00E+03	1.05E-06	2 2
Giordabas	9.02E-07	1.10E+03	8.23E-10	2	3.31E-04	6.00E+03	5.51E-08	2
	1.04E-05	1.46E+02	7.15E-08	2	3.83E-03	3.00E+01	1.28E-04	2
honvolohond	Z.40E-03	1.10E+02	2.19E-07	٤	8.79E-03	1.50E+04	5.86E-07	2
Chryspa	2.27E-06	2.1/E-02	1.05E-04	2	1.94E-03	6.00E+02	3.24E-06	2
henzelly(Illustrations	2.305-00	Z.1/E+00	1.10E-06	2	2.04E-03	2.00E+02	1.02E-05	2
henzo(k)(lioranthene	4.32E-0b	2.1/E-02	1.16E-04	٤	5.40E-04	NA		na
Benzolelinviene	1,00E-00	Z.1/E-01	7.37E-06	2	3.42E-04	NA		na
horzofalourona	0.205-00	N/		na	5.76E-04	NA		e
indeport 2.3 edhurana	2.33E-06	2.17E-03	1.07E-03	S.	1.99E-03	7.50E+03	2.66E-07	2
dibenz(a h)anthracene	2.9/E-06	2.1/E-02	1.37E-04	2	6.36E-04	NA		na
	3.005-07	2.1/E-03	1.41E-04	2	2.62E-04	3.00E+04	8.72E-09	2
2 GMM Bisk VIS		ı					T	

	⊋	
٤	₹	
٤	રુ	
٤	~	
7		
۲	_	

<u> </u>		Health-Based	Cartridge DC	DIC:	Cartridge, 9MM Ball, M882 DODIC: A363			
Compound	C _{chronic} (µg/m³)	Screening Level (µg/m³)	C _{chrontc} /	> 12	Cacute (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 1?
Denzo(g,n,i)perylene	1.57E-05	NV		na	5.76E-03	3.00E+04	1.92E-07	5
2378-Tetrachlorodibenzo-n-diovin	V14							
12378-Pentachlorodibanzo-p-diocin	¥ ×	4.48E-08		na	NA	3.50E+00		92
123478-Hexachlorodibenzo-n-diouta	¥ .	N/		na	ΑN	2.50E+00		2 2
123678-Hexachlorodibenzo-n-dloxin	ξ.	N .		na	ΑN	AN		2 2
123789-Hexachlorodibenzo-p-dioxin	AN	1 48E-08		g	ΑN	1.50E+01		E
1234678-Heptachlorodibenzo-p-dioxin	1.93E-11	N/		<u>e</u>	NA	NA		g
	1.12E-10	2		<u> </u>	1.77E-09	WA		БП
2378-Tetrachlorodibenzo-p-furan	NA	2		<u> </u>	4.09E-08	1.50E+02	2.73E-10	2
12378-Pentachlorodibenzo-p-furan	¥	2		<u> </u>	<u> </u>	Z.00E+00		na
23478-Pentachlorodibenzo-o-furan	¥	2		2 2	¥ S	NA NA		па
123478-Hexachlorodibenzo-p-furan	ΑN	N		2 2	¥N.	7.50E-02	,	na
123678-Hexachlorodibenzo-p-furan	AA	À.		2 2	¥Z.	7.50E+00		па
123789-Hexachlorodibenzo-p-furan	ΝΑΝ	N		<u> </u>	¥	2.50E+00		æ
234678-Hexachlorodibenzo-p-furan	NA	2	1	<u> </u>	¥.	ΨW		a
1234678-Heptachlorodibenzo-p-furan	1.51E-11	2		<u> </u>	A DOLL	1.50E+00		na
1234789-Heptachlorodibenzo-p-furan	AN	N		2 2	80-30E-1	¥		na
OCDF	ΑA	2		9 0	Z 2	NA 100		na
					Ş.	3.00E+02		g
Nitrobenzene	NA	2.09E+00		2	VIV.	77.1		
2-Nitrotoluene	NA	3.65E+01		2 2	Z AZ	1.015.404		ē
3-Nitrotoluene	NA	3.65E+01		2	AN	X		g
4-Nitrotoluene	¥	3.65E+01		2	AIA	70.1100		па
Nitroglycerine	NA	4.80E-01		2 2	Ç V	3.37E+04		g
1,3-Dinitrobenzene	ΑN	3.65E-01		2 2		NA 1		na
2,6-Dinitrotoluene	ΑN	3.65E+00		5 2	<u> </u>	3.00E+03		na
2,4-Dinitrotoluene	NA	7.30E+00		<u> </u>	¥N.	6.00E+02		na
1,3,5-Trinitrobenzene	AN	1.10E+02		<u> </u>	¥ S	6.00E+02		Б
2,4,6-Trinitrotoluene	NA	2.24F-01	+	<u>⊒</u> 2	YA S	3.00E+04		Вã
	NA	6 11E-02		<u> </u>	NA NA	2.50E+04		g
4-Amino-2,6-Dinitrotoluene	WA	NV NV		e g	YA.	NA		ē
2-Amino-2,6-Dinitrotoluene	¥	ÀN		<u> </u>	¥	NA		па
	NA NA	3 855-101		<u> </u>	¥	1.50E+04		ē
7		10.1000		na	AN AN	¥		5

			Cartridge, DOI	ige, 9MM Ball, DODIC: A363	Cartridge, 9MM Ball, M882 DODIC: A363			
Compound	Cehronic (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chrontc} / HBSL	> 12	> 17 Cacute (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV > 1?	> 12
XWH	914							
VIAIL	NA	1.83E+02	_	na	AN	ΔN		
Pentaerythritoltetranitrate	AN	NIV.				<u> </u>		na L
Dibutul Obtholota		201		BE	NA	5.00E+01		2
Cloudy Fillialate	NA	3.65E+02		na	A.N	1 50F+04		
Dioctyl Phthalate	AN	A ROE O1		1		100:1		Ja
Cimelination		1.00F-01		па	NA	1.00E+04		a
1	NA	9.13E+01		na	AN	2 00E 104		
Footnotes:			·			3.00E.TU4		na E

NA: Not applicable because compound was not detected. na: Not available because health-based sceening value is not available or not applicable if compound was not detected.

NV: No value available.

Cchronic: Chronic time-averaged concentration

HBSL: Chronic health-based screening level

Cacute: acute concentration

ATV: Acute toxicity value

APPENDIX E

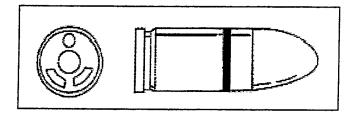
FACT SHEET SUBMITTED TO THE U.S. ARMY ENVIRONMENTAL CENTER

U.S. Army Environmental Center Training Munitions Fact Sheet

M882 9-mm Ball Cartridge

Department of Defense Identification Code: A363

Breathing air emissions from the M882 9-mm ball cartridge will not impact the health of residents who live near Army training facilities.



To be fully prepared to protect our country, U.S. soldiers must train with many different weapons and munitions, including the M882 9-mm ball cartridge. This training is important because it helps prepare our soldiers for a variety of combat situations. While the Army recognizes the value of such comprehensive training on our installations, we also work hard to ensure the safety and health of surrounding communities.

WILL BREATHING AIR EMISSIONS FROM THE M882 9-MM BALL CARTRIDGE AFFECT MY HEALTH?

To answer this question, the U.S. Army tested the air emissions that are released when the M882 is fired. The information gathered during these tests was then analyzed to determine if there would be a potential for health effects from inhalation to residents who live near training areas. Study results, generated using conservative methods, showed that offsite residents breathing air as close as 100 meters (328 feet or about the length of a football field) from the firing location are safe from these emissions. At most locations, training areas are at least 1,000 meters (over half a mile) away from populated areas and the distance to firing locations may be even farther.

How Was THE STUDY CONDUCTED?

To gather data for this study, the M882 was fired from the M9 pistol in a test chamber. The air in the chamber was then tested to identify the types and amounts of substances released. About 300 different substances were looked for during this part of the study.

This information was then used in an U.S. Environmental Protection Agency (USEPA) approved air model (a computer program that allows estimation of air concentrations) to determine the amount of each substance to which someone living near a training site might be exposed. Downwind concentrations were estimated based on a typical use scenario for the M882 during training exercises.

Since this study did not look at any one specific training area, the assumptions used in the model would, in most cases, predict higher downwind air concentrations than those expected at an actual training site.

These estimated air concentrations were then compared to screening levels established by the USEPA and other federal agencies. If the air concentrations are less than these screening levels, they are considered safe for the general population, including sensitive people such as the sick, elderly, and children.

WHAT ARE THE STUDY LIMITATIONS?

Many steps were taken to ensure that the results of this study are protective of residents who live near training facilities. However, as with any study, this study has limitations. For example, the study does not consider exposure to other types of munitions that could also be used during the same training event. Due to these limitations, conservative model conditions were used to ensure the protection of public health from breathing M882 air emissions.

WHAT EXACTLY IS THE M882 9-MM BALL CARTRIDGE?

The M882 cartridge is a type of ball ammunition used in training and combat. It is used with pistols and submachine guns on firing ranges during training activities. The M882 consists of a cartridge case made of copper alloy and a bullet containing a copper alloy jacket and a lead-antimony slug. The propelling charge is made primarily of nitrocellulose and nitroglycerin. Nitrocellulose is commonly used in furniture lacquers, printing inks, nail polish, and as a primary ingredient in smokeless propellants for military and commercial use. Nitroglycerin is a component in dynamite and is used for military and industrial purposes such as mining and demolition. The M882 does not have any notable markings and can be identified by its plain bullet tip.

WHERE CAN I GET MORE INFORMATION?

For more information on the M882 or other military munitions, please call the Army Environmental Hotline at 1-800-USA-3845, visit our Web site at www.aec.army.mil, or e-mail t2hotline@aec.apgea.army.mil.